

A pilot study of a multi-source feedback process for hospital/healthcare-
system pharmacists in Saskatchewan

A Thesis submitted to the
College of Graduate and Postdoctoral Studies
In Partial Fulfillment of the Requirements
For the Degree of Master of Science
In the College of Pharmacy and Nutrition
University of Saskatchewan
Saskatoon

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Abstract

Multisource feedback (MSF) is a promising tool for assessing healthcare professionals' competencies, including pharmacists. Despite its potential, gaps remain in understanding pharmacists' readiness for and the validity and reliability of the MSF process. This study investigated MSF's application among hospital/healthcare-system pharmacists, evaluating its validity, reliability, feasibility, and acceptability.

Participants (ratees) were hospital/healthcare-system pharmacists in Saskatchewan, Canada. They completed a self-assessment and recruited eight peer and eight non-peer raters (raters) to complete an assessment of them utilizing an online questionnaire. Ratees were provided with an anonymized collated report of their ratings and then participated in a facilitated discussion to review the report. Ratees and raters completed a survey to assess perceptions of the process's validity, reliability, acceptability, and feasibility. Validity was assessed through multiple sources: content validity was supported by a focus group and literature review; construct validity was examined by comparing mean rating scores from ratees, peers, and non-peers with previous MSF studies; and response process validity was evaluated by analyzing the frequency of "unable to assess" responses. Reliability was assessed using Cronbach's alpha for peer and non-peer ratings, and free-text responses in the survey underwent structured tabular thematic analysis.

Nine ratees completed the MSF process (response rate 2.5%). Recruiting the desired number of raters was a challenge; one out of nine participants recruited 16 raters. Despite these challenges, the MSF process demonstrated acceptable content, construct, and response process validity. Only one out of 18 questions had an "unable to assess" response rate greater than 20%, indicating strong response process validity. Internal validity was supported by Cronbach's alpha of 0.87 for non-peer and 0.89 for peer rating items. Ratees generally viewed the feedback as constructive, particularly regarding communication, collaboration, and professionalism competencies. The MSF process took a mean of 22 minutes for ratee self-assessment, 14.5 minutes for peer raters, and 10.3 minutes for non-peers; ratees and peers found the time burdensome, while non-peers did not.

This study highlights the potential of MSF to enhance pharmacist competencies while identifying challenges prior to wider implementation. Further research is recommended to

strengthen MSF's impact on pharmacy practice and patient care.

Acknowledgements

I would like to express my deepest gratitude to Dr. Yvonne Shevchuk, my supervisor, for her unwavering support, guidance, and expertise throughout the course of this work. Her mentorship has been invaluable in shaping this thesis, making it not only an amazing learning opportunity but also an enjoyable and fulfilling journey.

I would also like to acknowledge the support of my advisory committee members: Drs. Shauna Gerwing and Katelyn Halpape. Thank you for the time, expertise and support throughout this project; your dedication was much appreciated.

I extend my sincere thanks to the Saskatchewan College of Pharmacy Professionals for their support and to the Royal University Hospital Foundation and Canada Life for their generous support. Additionally, I extend thanks to Nancy Winslade for providing the foundation for this project.

I am also grateful to the pre-pilot focus group participants for their thoughtful feedback on the MSF questions, which helped refine the methodology of this project.

I would like to thank Dr. J. Lockyer for her insightful training on the R2C2 method, which significantly enriched the facilitated discussion process.

To all the individuals and organizations who contributed to this research, directly or indirectly, I am truly appreciative of your time, expertise, and encouragement.

Lastly, I dedicate this paper to my mother and father, Penny and Dave Herbert. Thank you for always being my biggest supporters and unwavering sources of encouragement. To my partner Allie. Thank you for believing in and encouraging me throughout this journey.

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List of Abbreviations

ACPR: Accredited Canadian Pharmacy Residency

AFPC: Association of Faculties of Pharmacy of Canada

B.S.P: Bachelor of Science in Pharmacy

CanMEDS: Canadian Medical Education Directives for Specialists

CE: Continuing education

CPD: Continuing professional development

CPRB: Canadian Pharmacy Residency Board

CSHP: Canadian Society of Healthcare-systems Pharmacy

MSF: Multisource feedback

OSCE: Objective Structured Clinical Examinations

NAPRA: National Association of Pharmacy Regulatory Authorities

PHARMD: Doctor of Pharmacy

SCPP: Saskatchewan College of Pharmacy Professionals

SHA: Saskatchewan Health Authority

Chapter 1 Introduction

1.1 Pharmacy Competency

In many countries, such as the United Kingdom, New Zealand, the United States, and Canada, expanded patient-centered roles and scope of practice for pharmacists have been realized through a range of policy changes and healthcare system reforms in the wake of continued pressures on healthcare systems (Bragazzi et al., 2020; Chiu et al., 2022; Tannenbaum & Tsuyuki, 2013). Expanding pharmacist roles and scope of practice requires an adaptable and competent workforce to deliver the range of current and new pharmaceutical services. These new pharmaceutical services range from medication assessments, minor ailment prescribing, and administration of vaccines to rounding with the multidisciplinary team, ordering laboratory tests, and collaborative prescribing agreements (Raiche et al., 2020; Tannenbaum & Tsuyuki, 2013). A basic prerequisite to support pharmacists' professional development in the ever-changing demands of modernized health systems is the creation of pharmacy competencies that reflect the growing scope and role of pharmacists (Forsyth et al., 2019; Hill et al., 2006; Saseen et al., 2017). Competencies guide education and training, ensuring adaptability, consistency in care, and role clarity, enabling pharmacists to meet new responsibilities and deliver high-quality care in modernized health systems (Ballaram et al., 2024).

Competency can be simply described as practitioners being “fit for purpose” (Meadows et al., 2004, p. 789). However, defining competence in professional practice can be more complex; Holland and Nimmo (1999) describe competency as psychomotor skills and intellectual problem-solving combined with a person’s attitudes, values, and judgment. Nimmo and Holland (1999) examined competency in terms of how a pharmacist integrates technical skills with cognitive abilities to provide care. They suggest that professional competence in pharmacy results from combining psychomotor skills and problem solving with professional socialization (attitudes, beliefs), judgment

(practice with feedback, reflection on practice), and the specific knowledge required within the pharmacist's practice model.

One of the most widely cited and impactful definitions of professional competency, while not specific to pharmacists, is provided by Kane (1992) as “the degree to which the individual can use knowledge, skills, and judgment associated with the profession to perform effectively in the domain of possible encounters defining the scope of professional practice” (p. 5). The competency of physicians was reviewed by Epstein and Hundert (2002), expanding the definition to not only knowledge, skills, attitudes, and beliefs but to the context of competence to

the task at hand. Epstein and Hundert (2002) defined competence as “the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, personal wellness, resiliency, and reflection in daily practice for the benefit of the individual and community being served” (p. 226). This definition and how competency is applied and measured will depend on the stage of a professional's career. “Competence is a statement of the relationship between ability, a task, and the health system they practice in and the clinical contexts in which those tasks occur” (Epstein and Hundert, 2002. p. 228). For instance, an early-career professional's competency may rely heavily on foundational knowledge and problem-solving skills, while an experienced physician can draw on a deeper level of practical expertise. Epstein's definition of competency was adopted by the Saskatchewan College of Pharmacy Professionals (SCPP) in 2022 as part of reviewing and revising its competency assessment program. SCPP is the self-governing body for the profession of pharmacy in Saskatchewan.

Under authority of [*The Pharmacy and Pharmacy Disciplines Act*](#) ("the Act"), SCPP works to protect the public by regulating pharmacists, pharmacies, pharmacy technicians and drugs (The Pharmacy and Pharmacy disciplines Act, 1996). Pharmacy as a self-regulating profession is accountable to the public for ensuring the provision of safe, quality, and ethical care. SCPP is responsible to ensure all pharmacy professionals in Saskatchewan are fully qualified and able to provide this standard of care. To this end, professional regulatory organizations are legislated to protect patients and ensure pharmacist competence, which they do by implementing appropriate monitoring and assessment programs. Competency is achieved by improving a pharmacist's knowledge, skills, and performance (McLaughlin et

al., 2017).

Pharmacist practice standards, outcomes, and competency documents outline the specific knowledge, skills, and performance required to practice including intrinsic roles that are critical to the provision of safe and effective patient care. Currently, there are a number of documents for Canadian pharmacists which suggest standards of practice. The Association of Faculties of Pharmacy of Canada (AFPC) educational outcomes define expected performance for students upon completion of their first professional degree program in pharmacy (AFPC, 2010). The Canadian Pharmacy Residency Board (CPRB) standards created by the Canadian Society of Healthcare-systems pharmacy (CSHP) outline the expectations upon completion of a pharmacy practice residency (CSHP, 2009). The National Association of Pharmacy Regulatory Authorities (NAPRA) model standards of practice outline the standards required of pharmacists to practice throughout their career (NAPRA, 2022). However, there is only one document which refers to competencies. This is the NAPRA professional competencies for pharmacists and pharmacy technicians at entry to practice in Canada (2024). These competencies outline what pharmacists at entry to practice are expected to be able to do at work, as opposed to the standards of practice which contain information on how to perform these tasks. Key competencies included in the NAPRA 2024 document include Providing Care, Communication and Collaboration, and Professionalism.

Across healthcare professions, despite variations, communication, professionalism, and collaboration are essential competencies for patient safety (Bonds, 2018; Desmedt et al., 2021; John et al., 2020). Poor communication with patients and colleagues, and unprofessional behaviour are known to have a negative effect on patient care and outcomes (McNamara, 2012; Rosenstein & O'Daniel, 2008). For example, inadequate handover communication leads to errors that affect patient safety. Similarly, unclear, or inappropriate communication affects patient care (e.g., unclear medication instructions, ineffective collaboration regarding treatments plans, or poor communication of medications at transitions in care with patients). Unprofessional conduct that hinders open and respectful communication among all members of a patient's care team can jeopardize the safety of that care (Lockyer & Sargeant, 2022). In contrast, good communication and professionally managed collaborative skills improve patient safety (Rosenstein & O'Daniel, 2008). If the

competencies of communication, collaboration, and professionalism could be improved through continuing professional development, patient outcomes and experiences may be improved.

1.2 Continuing education (CE) and continuing professional development (CPD)

One mechanism professional regulatory organizations use to attempt to ensure competency is by mandating minimum standards of CE for pharmacists (Gershuni et al., 2023; McConnell, 2002). The Accreditation Council for Pharmacy Education defines CE as “a structured educational activity designed or intended to support the continuing development of pharmacists to maintain and enhance their competence” (2015, p.16). SCPP defines CE as “structured, teacher-designed learning activities that are intended to increase the knowledge, skills, and/or competence of pharmacy professionals” (2024, p. 2). CE is generally understood as any learning activities that pharmacy professionals engage in throughout their careers (Chan, 2002). Professionals obtain CE through various means, including attending workshops, conferences, and seminars, participating in courses, and completing certification programs, all of which help maintain and enhance their knowledge and skills in their respective fields (Driesen et al., 2008; Obreli-Neto et al., 2016).

However, there is variability from province to province and profession to profession regarding how much CE is needed, what kind of CE is needed, and how and when CE should be obtained by the healthcare professional (Landers et al., 2005; McConnell et al., 2010). After the completion of accredited undergraduate education, most of the pharmacist's career is spent completing CE that relies on self-assessment to determine learning and improvement needs. A systematic review by Davis et al. (2006) of physician self-assessment found that physicians had a limited ability to self-assess and this is similar to pharmacists and pharmacy students (Motycka et al., 2010). There can be multiple reasons for poor self-assessment including: “above average” interpretations of performance, overconfidence, assessing for the wrong reasons, and misaligned motivations (Eva & Regehr, 2008). Self-assessment is often perceived as a single scale, moving from positive to negative or from underestimation to overestimation (Ng & Earl, 2008). However, it is likely that self-assessment is much more complex because people have

different abilities and skills in most facets of life that are dependent on requirements and social context (Motycka et al., 2010). Finally, complex behaviours like professionalism, communication, and collaboration are difficult to assess and improve through traditional continuing education (Forsetlund et al., 2009). This led to the Institute of Medicine, an independent North American organization advising on health policy, concluding that there are major flaws in the way continuing education is conducted, financed, regulated, and evaluated (2010). The Institute of Medicine (2010) states that the future of continuing education will follow a model known as CPD, where learning occurs throughout one's career and extends beyond traditional classroom settings, reaching into the point of care.

CPD is a self-directed, ongoing, systematic, and outcomes-focused approach to lifelong learning that is applied to practice (Wheeler & Chisholm-Burns, 2018). In 2002, the concept of CPD was defined by the International Pharmaceutical Federation as “the responsibility of individual pharmacists for systematic maintenance, development, and broadening of knowledge, skills, and attitudes, to ensure continuing competence as a professional, throughout their careers” (2022, p. 2). Research shows that participation in self-directed learning activities that use a range

of pedagogical methods and are based on identified learning needs and personal goals that are relevant to practice, interactive, ongoing, have clear outcomes for the practitioner and the organization, and can be reinforced through practice, are more likely to achieve sustainable learning and change in practice (Cooley et al., 2023; DeVolld et al., 2022; Forsetlund et al., 2021; Magwenya et al., 2022; Owen et al., 2020; Sachdeva, 2016).

CE and CPD are both critical components in the lifelong learning of healthcare professionals, but they differ in scope and approach. CE refers to episodic interventions designed to address educational gaps and is typically teacher/instructor directed (Filipe et al., 2014). As well, many CE interventions typically encompass the clinical domain. In contrast, CPD is lifelong, based on ongoing self-assessments designed to address the educational needs of the individual. It is learner centered and driven. CPD is a broader, more holistic approach to lifelong learning and it encompasses clinical competencies as well as others like communication, collaboration, and professionalism (Micallef & Kayyali, 2019). By addressing the diverse and dynamic needs of professionals throughout their careers, CPD promotes the maintenance and improvement of standards of health

professional practice.

To enhance CPD programs, many organizations have recognized that CPD requires a multi-model approach (Massagli & Carline, 2007; Davies et al., 2013). A multi-modal approach can include in-person lectures, online learning platforms, group discussions, team tasks, individual and/or collective reflections, observations of clinics, community development, and improvement projects (Miller et al., 2019). Some CPD programs have evolved to focus on members collecting and analyzing data from their practices to identify practice issues for improvement and to guide their learning (Davis et al., 1999; Forsetlund et al., 2009)

1.3 Multi-source feedback (MSF)

While CPD supports ongoing learning and development across various competencies, MSF serves as a tool within this framework, offering structured, multi-perspective insights that help practitioners identify and address specific areas for improvement. MSF, also known as 360-degree feedback, is a type of formative performance assessment that provides feedback on various tasks and behaviours from various reviewers (Lockyer, 2003a). The use of MSF in business and manufacturing became popular in the 1980s and continues today, with its application expanding to healthcare (Bracken et al., 2001). MSF is a questionnaire-based process involving the rating of multiple performance domains and items by various reviewer groups (e.g., supervisors, peers, near-peers, clients/patients) and by self-assessment of the rater (the individual being assessed). It was initiated in response to the growing complexity of managerial and professional performance, and the recognition that performance comprises several roles or domains and that different reviewer groups can provide different insights into the performance of others. It is intended, not as a single event, but as an ongoing, regular, quality improvement process supported by the organization (Bracken et al., 2001). MSF intends to be developmental to guide behaviour change and performance improvement (Bracken et al., 2001; Bracken et al., 2016; Sargeant, 2006). McCarthy and Garavan (2001) conducted a comprehensive review of MSF in industry and noted five potential purposes: 1) Developing insight into strengths and weaknesses, 2) Enhancing culture change, 3) Summative assessment of performance, 4) Evaluating the potential of

individuals, for instance, to use in career advice or, and 5) Enhancing team effectiveness. MSF has been shown to enhance collaboration and teamwork (Druskat & Wolff, 1999; Hennel et al., 2022; Lockyer, 2013) professionalism (Lockyer & Sargeant, 2022), and communication (Björklund et al., 2022; Kadden et al., 2024; Lockyer, 2013; Waldman & Bowen, 1998). There are practical reasons for MSF to focus on these competencies. They can be easily observed by other colleagues, interprofessional co-workers, and patients and are not easily assessed by other methods (Al Ansari et al., 2016). Additionally, regulators and healthcare systems continue to identify communication, professionalism, and collaboration as areas that receive more formal patient complaints than other roles, suggesting healthcare professionals may need to continue to improve in these areas (C. Lambert, personal communication, October 8, 2024; Sidhu et al., 2017; Wenghofer et al., 2015).

MSF questionnaires use Likert-type rating scales and specific items pertinent to the assessed domain or competency and undergo psychometric testing to ensure reliability and validity (Sargeant, 2006). Additionally, many MSF questionnaires have started incorporating narrative comments as they have been shown to be a valuable and informative data source in addition to numerical feedback (Govaerts & van der Vleuten, 2013; van der Leeuw et al., 2016; van der Leeuw et al., 2013). Self-assessment is an essential part of MSF processes for healthcare professionals as a ratee's (the individual being evaluated) ability to accurately self-assess is an important and integral component of CPD (Probyn et al., 2014; Silver et al., 2008). In the MSF process, a healthcare professional may observe a close correlation between how they see their performance and how it is rated or perceived by their peers, which can lead to validation. Conversely, the healthcare professional may notice a significant discrepancy between the self- assessment and rater ratings. This may prompt a discussion of the ratee's skill at self-reflection and self-assessment. Having a tool like MSF that combines self-assessment with peer assessment can provide insight into the professional lifelong obligations of self-monitoring and informed self-assessment (Sargeant, 2015).

MSF questionnaires are intended for use by raters who are individuals who work closely with the person being assessed and who can observe the competency in question. During the MSF process raters can be selected by the ratee or by a supervisor (Lockyer &

Sargeant, 2017). There are advantages and disadvantages to the self-selection of raters. One advantage is the potential to increase the motivation of raters, as they have personal relationships with the person being rated (Church et al., 2000). Furthermore, acceptance of feedback and perception of the fairness of the MSF process is enhanced when the ratee is allowed to select their own raters (Yama et al., 2018). This process of acceptance and perception of fairness increases motivation for change (Bracken et al., 2001). However, personal motivation can interfere with the process of getting accurate feedback and evaluation. Ratees can self-select raters who may be more likely to provide higher ratings and/or positive feedback, especially if the MSF is used as a formal workplace performance assessment (Archer & McAvoy, 2011; Herold & Parsons, 1985). In this case, MSF would not produce accurate, effective, and useful information for the ratee. Providing rater training can enhance the understanding of the competencies, tools, and scales (Bracken et al., 2001).

At the end of the MSF process, ratees receive a personalized report that includes scores for each assessed item and competency, their self-assessment scores, and scores from each rater group. In many cases the report also presents scores from a relevant norm group for comparison. Reflection on the feedback in the compiled report should be facilitated by a trained peer or coach mentor and ideally ratees should create an action plan for improvement which includes the development of clear, actionable, and time-bound goals (Lockyer & Sargeant, 2022). MSF outcomes are more likely to be realized when goals are clear and explicit, recipient-defined, and time-bound; involve interaction and facilitation and include an action plan as part of feedback (Hart et al., 2019; Ramani & Krackov, 2012; Roy et al., 2023). The role of the facilitator is to maximize feedback acceptance and use and more broadly, to enhance the recipient's self-assessment and reflective capacities, and to promote personal and professional growth (Denisi & Kluger, 2000; Goodstone & Diamante, 1998). Ultimately, MSF is intended to improve an aspect or aspects of an employee's behaviour and job performance by providing quality-improvement feedback from multiple and varied sources or perspectives (Bracken et al., 2001). This approach supports a more holistic assessment of an individual's abilities, identifying strengths and areas for development across a wide range of competencies critical to professional success.

Based on the MSF literature for physicians, Lockyer and Sargeant (Lockyer & Sargeant, 2017) developed the Medical Council of Canada 360 MSF implementation guidelines which emphasize a structured approach to evaluating the performance of physicians through comprehensive feedback from multiple sources. The guidelines highlight the importance of engaging key stakeholders, including program directors, faculty, and residents, to design an MSF process that aligns with the training program's objectives and professional standards. Core competencies for evaluation are identified and relevant feedback tools are developed or adapted to ensure clarity and relevance. Training for raters is emphasized to guarantee their understanding of the evaluation criteria and ability to provide constructive feedback. A pilot study of ten to twenty participants is recommended to test the MSF process, gather initial data, and address potential issues before full implementation. The guidelines also underscore the significance of maintaining rater anonymity to encourage honest and candid feedback, while mitigating potential biases. These guidelines outline the steps for the full MSF process, from data collection to feedback delivery. Feedback from various sources, including self-assessments, peers, supervisors, and patients, is collected and analyzed to identify patterns, strengths, and areas for improvement. Constructive feedback is then provided to physicians, facilitating their reflection and development. The guidelines advocate for continuous improvement through regular reviews and refinement of the MSF process based on participant feedback and achieved outcomes. Additionally, the guidelines suggest facilitated feedback by trained peer coaches and the development of action plans based on MSF feedback.

As medication experts and trusted healthcare professionals, pharmacists have an essential role in promoting rational, evidence-based, and optimal medication use for their patients. To achieve this, pharmacists must maintain a high degree of competency. The addition of MSF to contemporary CPD may assist pharmacists in obtaining feedback from diverse perspectives, which provides a more comprehensive understanding of their performance and areas for improvement, ultimately enhancing their professional growth and competency.

Chapter 2 Literature Review

2.1 Search strategy

This chapter provides a review of the literature on the use of MSF across various health professions and establishes a foundation for a pilot study. The review was conducted in June 2023 in the databases of OVID Medline and PubMed. The MeSH terms identified for the OVID Medline search were adapted to corresponding terms in PubMed. Monthly email alerts through each database were created to ensure new literature was not missed between the original search and November 2024. The database searches were complemented with a manual review of the reference lists of relevant articles, which resulted in additional articles included in the review. A gray literature search using Google Scholar was conducted to find existing MSF programs of healthcare professionals in Canada (Table 1). The full search strategy is included in the appendix (**Appendix A**).

Table 1: MSF programs of healthcare professionals in Canada

Professional college	Ratees	Raters	Content	Process
BC College of Nursing Professionals	Random assignment of nurses following their practice renewal registration	Self-assessment 10 self-selected colleagues that are familiar enough with the individual's practice to comment on observable behaviours	<ul style="list-style-type: none"> Self-reflection: 21 clinical and 19 non-clinical (focused on responsibility and accountability, professionalism, communication and collaboration) questions with open-text boxes for reflection after each question Colleague 	<ul style="list-style-type: none"> Once finished their registration renewal individuals are randomly chosen for multi-source feedback Professional picks 10 colleagues who are given a 30-day period to submit an online assessment of clinical and non-clinical skills Professional is provided

			review: 20 clinical and 18 nonclinical (Focused on responsibility and	with a confidential report that shows their own self-assessment and colleagues' feedback
			accountability, professionalism, communication and collaboration) questions with open text boxes to comment on the behaviours. Scores for both range from 1 - 9 (1-3 below expectations, 4-6 met expectations, 7-9 above expectations)	<ul style="list-style-type: none"> • Once read, they can begin creating an Action Plan and work with a nurse advisor to identify opportunities for improvement • One year later, the professional reviews their Action Plan and reflects on their progress – they are exempt from the MSF for another five years
College of Registered Nurses of Manitoba	Random assignment of 2% of nurses following their practice renewal (moving to a risk-based selection model)	Self-assessment 6-10 self-selected colleagues and 8-18 self-selected clients (For clinical RNs and RN (NPs only)	<ul style="list-style-type: none"> • Self-assessment: 31 (For clinical RNs and NPs) or 30 (for non-clinical) statements with ratings from 1 (below expectations) to 9 (above expectations) • Colleague review: respond to 32 statements with ratings from 1 (below expectations) to 9 (above expectations) 	<ul style="list-style-type: none"> • Individual is selected for MSF following their practice renewal • Provided with a notification letter, colleague tracking sheet and public awareness pamphlets • Once the minimum requirements for each MSF are met the results are aggregated and presented by providing a score based on the responses submitted, an average score of all the

			<ul style="list-style-type: none"> • Client review: respond to 30 statements with ratings from 1 (below expectations) to 9 (above expectations) 	<p>nurses participating in multi-source feedback, and the difference between their score and the average</p> <ul style="list-style-type: none"> • The results are then used by the individual to inform their self-development plan and by the college to
				<p>review results against their norms and thresholds. The college recommends discussing your MSF report with a trusted colleague.</p> <ul style="list-style-type: none"> • If the nurse falls below the threshold (established by a standardized score and percentile rank) they may be referred to a competency-based interview to assess knowledge, skills and judgment

<p>Colleges of Registered Nurses of Nova Scotia</p>	<p>Random selection of 20% of nurse practitioners (with participation required only once every five years)</p>	<p>Self-assessment 10 nurse practitioners and physician colleagues and 10 other members of the health team or health providers</p>	<p>•A survey of approximately 20 questions sent to participants and the individual (for self-assessment) on management of health (including assessment and diagnosis, therapeutics, consultation and referral), communication, and professional accountability and leadership • Surveys mix the type of questions asked, including multiple choice, Likert scales, and open text questions</p>	<p>• Individual is selected for MSF and is responsible for identifying 20 reviewers • Reviewers are each asked to submit answers to the surveys and individuals are asked to complete a self-assessment • Findings are aggregated, and an individual report is generated based on feedback and presented to the nurse • Some individuals may be selected for a secondary review which consists of a site visit with a practice reviewer (who has a similar background to the nurse being evaluated) as well as an interview, formal chart-audit, chart-stimulated recall interview and on-site practice assessment</p>
<p>Medical Council of Canada*</p>	<p>Used by a range of colleges of physicians for practice assessment following application for license renewal:</p> <ul style="list-style-type: none"> • Manitoba 	<p>Self-assessment 8-12 physician colleagues, 8-12 non-physician co-workers, and 25-35 patients</p>	<p>•Four assessments (self-assessment, patients, non-physician coworkers, and physician colleagues) 30 items based on the CanMEDS roles of</p>	<p>•Once selected, physicians are responsible for recruiting their own reviewers • Once the data is received by the college it will be aggregated so the physician receives reports for</p>

	<ul style="list-style-type: none"> • Saskatchewan • Alberta 		<p>collaborator, communicator and professional</p> <p>Each item is accompanied by a five-point Likert scale (strongly disagree to strongly agree with a neutral point, as well as an unable to assess option) and free-text comments to provide additional details</p>	<p>patients, non-physician coworkers and physician colleagues separately along with self-assessment</p> <ul style="list-style-type: none"> • Physicians receive a report that provides graphical data for the three roles and items delineating how well the physician did, frequencies and average weighting for each of the items, self-assessment comparator graphs, and free-text comments <p>Physicians are then asked to meet with a facilitator/coach to have a feedback conversation about their MSF report and develop an action plan for the following six to 12 months</p>
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<p>College of Dietitians of Ontario</p>	<ul style="list-style-type: none"> • Random selection of 10% of registrants annually 	<p>Self-assessment non-clinical dietitians require: 6</p>	<ul style="list-style-type: none"> • Three assessments (self-assessment, colleague, patient). 	<ul style="list-style-type: none"> • Once selected, dietitians are responsible for recruiting their own
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		<p>colleagues. Clinical dietitians require: 6 colleagues and 9 patients</p>	<p>16 items for self-assessment survey and 17 for colleague and patient survey. Based on the Integrated Competencies for Dietetic Education and Practice •Each item is accompanied by a seven-point Likert scale (strongly disagree, somewhat disagree to somewhat agree, strongly agree with a neutral point</p>	<p>reviewers •A score report is provided to participating dietitians. The report provides the mean score for each survey question and the normative reference score. The normative reference scores are established from all the co-worker and patient surveys that are submitted during the assessment process. •If dietitians fall below the normative score the quality assurance committee may recommend them to complete a behaviour-based interview with a peer-assessor and review by a quality and assurance committee</p>
College of Medical Radiation Technologists of Ontario	Each year council determines percentage of members that will randomly be selected	Self-assessment 10 patients and 4 peers/co-workers	<p>•Three assessments (self-assessment, peer/co-worker, and patient) based on college standards of practice. 28 items for self-assessment, 27 items for peer/co-worker, and 10 items for patients •Each item is accompanied by a five-point Likert scale (very poor to</p>	<p>•Once selected radiation technologists recruit their own reviewers •They receive a report with their self-assessment rating, the averaged ratings from peers/coworkers and the averaged ratings from their patients. These ratings are presented on a bar graph by each practice standard. They will also receive the average ratings by each survey statement</p>

			very good with a neutral point as well as an unable to assess option)	
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Data adapted from Waddell, K., & Wilson, M. G. (2019). Rapid synthesis: Using multi-source feedback and other practice assessments for quality assurance in nursing. McMaster Health Forum.

A summary table of studies reviewed is located in **Appendix B**. Studies included in the manuscript were reviewed using the McMaster critical review forms (Law et al., 1998; Letts et al., 2007) to guide appraisal and included settings and design, intervention, outcome, main findings, and strengths and weaknesses of each study. Development of an MSF process requires consideration of its validity, reliability, feasibility and acceptability, therefore the primary findings of MSF studies in relation to these four characteristics are examined. A review of the most relevant literature on MSF for healthcare professionals follows.

2.2 Validity

2.2.1 Content validity

Content validity refers to the relationship between the content in a test and the attributes or constructs it intends to measure (Kleinheksel et al., 2020). Content refers to the themes, wording, and format of the items, tasks, or questions on a test. Many MSF processes and tools are grounded in established professional standards to ensure they assess necessary competencies. For instance, the mini-Peer Assessment Tool (mini-PAT) used in the UK’s Foundation Program was mapped to the General Medical Council’s (GMC) Good Medical Practice framework (Archer, 2008). The mini-PAT is a MSF tool derived from the Sheffield Peer Review Assessment Tool (SPRAT) and adapted to assess junior doctors' competencies during their Foundation years. It focuses on clinical care, professionalism, and relationships with colleagues and patients, using a six-point rating scale to evaluate performance. The tool enables assessors, including peers, consultants, nurses, and allied health professionals, to provide structured feedback, helping trainees identify areas for development and inform their professional growth. The design of MSF processes involves

grounding the tool in well-established competency frameworks specific to each profession (Ashworth et al., 2021). This approach ensures that MSF captures a comprehensive range of skills, knowledge, and behaviours essential to the field, enhancing the tool's content validity. By mapping assessment items directly to these frameworks, MSF tools validate that each competency domain being assessed reflects real-world expectations of professional performance.

The INCEPT tool, validated by van der Meulen et al. (2017) for use with physicians in the Netherlands, aligns with the CanMEDS framework, a widely recognized set of professional roles developed by the Royal College of Physicians and Surgeons of Canada. The CanMEDS framework encompasses seven core roles: Medical Expert, Communicator, Collaborator, Manager, Health Advocate, Scholar, and Professional. In van der Meulen's study, the INCEPT tool was designed with 18 items and three global ratings as well as the inclusion of narrative feedback. This tool assessed multiple facets of physician professional behaviour, including "professional attitude," "patient-centeredness," and "organizational skills". These categories directly mirror the CanMEDS roles, supporting INCEPT's content validity.

In the context of pharmacy, Patel et al.'s initial study (2009) explored the mini-PAT's utility within hospital pharmacy by evaluating junior pharmacists across multiple competencies, such as clinical skills and communication, through feedback from healthcare professionals. This study found that feedback from non-pharmacist colleagues, including doctors and nurses, was especially valuable in assessing junior pharmacists' collaborative effectiveness in a multidisciplinary environment. This external feedback provided unique insights into pharmacists' interpersonal and teamwork skills which are crucial competencies for hospital practice. By incorporating perspectives from across the healthcare team, the study underscored the mini-PAT's comprehensive approach and relevance to pharmacy standards. Notably, follow-up studies continued to assess the same competencies with the mini-PAT (Patel et al., 2011; Davies et al., 2013).

For MSF tools to achieve true content validity, they must undergo rigorous development that involves input from content experts in the relevant field. Violato et al. (2003) emphasized the role of expert committees in constructing MSF instruments for

surgical assessments. In this case, a panel of surgeons and social scientists designed the tool to reflect competencies defined by the Royal College of Physicians and Surgeons of Canada. By including items on clinical performance, communication, professionalism, and teamwork, the MSF tool addressed both technical and non-technical skills essential for surgical practice, demonstrating its alignment with the profession's expectations.

By incorporating feedback from clinical experts and aligning with established guidelines, an expert-informed development process ensures the MSF tool reflects the complexities of clinical practice and adheres to standards set by regulatory bodies. Moreover, the process of mapping MSF items to these frameworks reassures raters and ratees alike that the feedback they receive is rooted in authoritative, profession-wide standards, thus promoting acceptance and utilization of MSF results for continuous improvement.

The alignment of MSF tools with established competency frameworks provides a robust foundation for content validity. By ensuring that items reflect the essential skills, knowledge, and behaviours endorsed by professional standards (such as those set by the GMC, CanMEDS, and pharmacy-specific frameworks like NAPRA), MSF tools offer feedback that is both relevant and actionable. This strategic alignment allows MSF not only to assess current competencies but also to serve as a guide for future professional development, as the competencies measured directly correspond to the expectations set by the profession.

2.2.2 Construct validity

Construct validity refers to how well a measure assesses the underlying theoretical construct it is intended to measure (American Educational Research Association, 2014). One of the most robust approaches to establishing construct validity in MSF tools is through factor analysis, which helps reveal the underlying structure of the assessed competencies. Wright et al. (2012) provided evidence of construct validity for the General Medical Council's MSF questionnaires by using principal component analysis, which identified two primary competencies: clinical and interpersonal skills. These competencies align with the theoretical framework underpinning the *Good Medical Practice* guidelines, reinforcing the tool's ability to measure distinct but complementary aspects of physician

performance accurately (General Medical Council, 2024).

Van der Meulen et al. (2017) validated the construct validity of the INCEPT tool, an MSF instrument designed to assess physicians. By employing both exploratory and confirmatory factor analysis, they identified three core competency dimensions: “professional attitude,” “patient-centeredness,” and “organizational skills.” Each dimension was distinct yet related, corresponding closely to the CanMEDS framework’s roles in medicine. This clustering of competencies supported the INCEPT tool’s ability to measure the specific constructs required for comprehensive physician performance evaluation, thereby validating its structure for capturing professional performance from diverse perspectives, including peers, residents, and coworkers.

Violato et al. (2003) examined MSF’s construct validity in the assessment of surgeons by ensuring that the tool measured both technical and non-technical skills, such as interpersonal communication, collegiality, and professionalism, alongside clinical competencies. This comprehensive approach reflects the multidimensional nature of surgical performance, where factor analysis showed distinct clustering for interpersonal and clinical constructs, supporting the tool’s validity in capturing the breadth of competencies expected of surgeons and aligning with the Royal College of Physicians and Surgeons of Canada’s standards.

In a similar approach to construct validation, Hengsomboon et al. (2017) used factor analysis to evaluate the MSF tool designed for physical therapy students. The tool’s structure revealed cohesive factors that corresponded to distinct physical therapy competencies, such as clinical reasoning and patient communication. Feedback from faculty, peers, and patients demonstrated consistency within each competency area, affirming the tool’s ability to accurately capture different aspects of professional practice within the physical therapy context.

In pharmacy, Patel et al. (2011) demonstrated the construct validity of the mini-PAT by showing that ratings from various healthcare professionals, including pharmacists, doctors, and nurses, consistently captured distinct competency areas relevant to pharmacists' roles. The study revealed systematic differences in scores between groups, with pharmacists rating their peers more critically on knowledge and clinical skills than other professionals. This difference supports the mini-PAT’s construct validity by

demonstrating that the tool is sensitive to both specific competencies and the perspectives of different respondent groups, which is crucial in multidisciplinary healthcare settings.

A common finding across numerous MSF studies is the presence of negatively skewed ratings, where the majority of scores are high and creating a leftward tail in the distribution. This trend has important implications for construct validity, as it suggests that assessors consistently rate healthcare professionals favorably on key competencies, indicating reliable measurement of these constructs. Lockyer et al. (2006), for example, found that anesthesiologists received high ratings across various competencies, such as communication and professionalism, with scores generally reflecting strong performance from colleagues and patients. This consistency in high ratings aligns with the tool's design, reinforcing its construct validity by effectively capturing essential professional behaviours. Similarly, Violato et al. (2003) and Patel et al. (2011) noted similar patterns of high ratings in their MSF studies with surgeons and pharmacists, where competencies like teamwork and clinical judgment were frequently rated positively. The prevalence of high, negatively skewed ratings across these studies and others (Archer et al., 2008; Violato et al., 2009; Wright et al., 2012) as well as other studies specific to pharmacists (Patel et al., 2009; Davies et al., 2013) supports construct validity by affirming that MSF tools reliably highlight the competencies aligned with professional standards, capturing strengths essential for clinical practice. This pattern of favourable ratings emphasizes MSF's utility for formative feedback, providing a dependable basis for professional growth in healthcare settings.

Construct validity is fundamental to the efficacy of MSF tools, as it ensures that each tool accurately captures the range of competencies necessary for professional performance. Studies across healthcare disciplines, including medicine, pharmacy, physical therapy, surgery, and nursing, demonstrate that MSF tools consistently differentiate between competencies through well-defined competencies supported by factor analysis and inter-rater consistency.

2.2.3 Response process validity

Response process validity examines the alignment between how an assessor and learner understand the goals of an assessment, how they engage with items within an

assessment, and whether there is a shared understanding of the assessment target (i.e. skill, competency, or behaviour of interest) (Shankar et al., 2022). Of note, previous studies have suggested that an "unable to assess" response rate of 20% or higher for any given statement or question in an MSF process may indicate that the statement is not assessable by the raters and requires revision or deletion (Lockyer, 2003a; Violato et al., 2003).

The Physician Achievement Review (PAR) in Alberta reported low "unable to assess" rates across patient, peer, and non-peer assessments, demonstrating that the items effectively captured competencies within the observational reach of these groups. This alignment contributed to high internal consistency and the tool's practicality in assessing a wide range of professional attributes (Hall et al., 1999)

Lockyer et al. (2006) provided evidence for response process validity in an MSF study involving anesthesiologists by demonstrating high engagement among raters, with consistently low rates of "unable to assess" responses. In their study only 1/11 patient survey questions, and 2/29 medical colleague survey questions had unable to assess rates greater than 20%. Additionally, another 1/11 patient survey questions and 3/29 medical colleague survey questions had an unable to response rate greater than 15%. The coworker survey questions in this study only had one question with "unable to assess" rate less than 20% but greater than 15%. These findings indicate that the assessed competencies, such as communication and teamwork, were observable by both medical colleagues and patients, supporting the relevance and accessibility of the MSF items in reflecting critical aspects of anesthesiologists' professional interactions.

Further support for response process validity comes from van der Meulen et al. (2017), who validated the INCEPT tool for evaluating physicians' professional competencies. The study's analysis of "unable to assess" responses found that peers, residents, and coworkers were able to consistently evaluate key competencies such as "professional attitude" and "patient centeredness" indicating the INCEPT items were accessible and relevant across multiple respondent groups. None of the questions in the INCEPT tool had an unable to response rate greater than 20%.

Violato et al. (2009) reinforced response process validity in a study focused on occupational therapists by examining the rates of 'unable to assess' responses. Their analysis showed that raters, including coworkers and clients, had little difficulty assessing

competencies related to communication, responsibility, and critical thinking, all of which are central to occupational therapy practice. Only 2/29 items on the co-worker survey had an ‘unable to assess’ rate greater than 20%. This low rate of ‘unable to assess’ responses suggests that the MSF items were well-targeted, covering competencies that were observable by different types of assessors, which supports the relevance and accessibility of MSF in capturing key performance areas within the profession.

Wright et al. (2012) also observed consistent engagement across respondent types in the GMC’s MSF tool, noting high response rates and low instances of “unable to assess” responses from both patients and colleagues; no questions had an “unable to assess” rate greater than 20%. This consistency in ratings across key competencies, such as communication and professionalism, supported response process validity, as the competencies were assessable and observable in real-world interactions, aligning with the expectations outlined in the *Good Medical Practice* guidelines (GMC, 2024).

In summary, response process validity in MSF tools is strongly supported by evidence of low rates of “unable to assess” responses, underscoring that MSF items can be accessible,

relevant, and meaningful across multiple healthcare professions. This also aligns with the feasibility of the MSF process, as low ‘unable to assess’ rates suggest that items are within the observational scope of assessors, thus reducing the cognitive burden and the time required for completion. When respondents find items assessable, the MSF process becomes more streamlined and efficient, supporting both the accuracy of competency assessment and the practical viability of implementing MSF in real-world settings. Consequently, this enhances the tool's effectiveness not only for formative assessment but also for continuous professional development.

2.2.4 Consequential validity

This aspect of validity refers to the overall impact of the assessment process (American Educational Research Association, 2014). Consequential validity is particularly important as the overall goal of MSF is to affirm or change a ratee’s behaviour based on feedback (Lockyer & Sargeant, 2022).

Fidler et al. (1999) found that 83% (249/300) of physicians reported engaging in

self- reflection because of MSF feedback, with 70% (210/300) considering specific practice changes, and 58% (174/300) implementing at least one change in response. Lipner et al. (2002) evaluated MSF's impact in a physician recertification program, finding that 70% (140/200) of physicians reported developing self-improvement plans based on feedback, with 58% (116/200) specifically targeting communication and professional interactions. This structured MSF approach provided practitioners with a clear roadmap for continuous improvement, showing that MSF has long-term effects on maintaining professional standards. This study by Lipner et al. (2002) emphasizes that MSF not only encourages immediate improvements but also supports sustained professional growth, underscoring its consequential validity in fostering alignment with recertification standards and continuous development.

In the Physician Achievement Review (PAR) study by Hall et al. (1999), 308 physicians received feedback on 106 aspects of their medical practices from peers, non-peer coworkers, and patients. Three months after receiving their feedback, 255 physicians were surveyed about any changes they had contemplated or implemented in response to the feedback. The results indicated that 83% had considered making changes, while 66% had initiated changes, particularly in areas of patient communication and support. Physicians who reported

contemplating or initiating changes generally had received lower (more negative) ratings, suggesting that the feedback influenced their decision to make improvements. This outcome reinforces the consequential validity of MSF by demonstrating that structured feedback can effectively prompt professional development, especially when specific areas for improvement are identified.

Violato et al. (2003) found that 83% (126/152) of surgeons who received MSF feedback reported contemplating changes in their behaviour, particularly in areas of interpersonal skills, collegiality, and professionalism. Of those, 66% (100/152) indicated they had taken concrete steps to implement at least one change based on the feedback received. This outcome underscores the consequential validity of MSF by demonstrating its ability to promote improvements in key competencies for surgical practice.

Lockyer (2003b) examined the likelihood of behaviour change among surgeons following MSF and found that 48% (34/71) of participants reported making specific

changes after receiving feedback, particularly when feedback highlighted discrepancies between self- assessment and peer evaluations. This is a lower likelihood of behaviour change than other MSF studies (Curran et al., 2024; Hall et al., 1999; Fidler et al., 1999; Lockyer et al., 2006; Roy et al., 2023; Violato et al., 2003). However, this study does still demonstrate that detailed actionable feedback, especially where there were gaps between self-perception and peer observations could have a significant impact on behaviour. Particular areas such as communication and professionalism were frequently targeted for improvement.

Lockyer et al. (2006) reported that 72% (62/86) of participating anesthesiologists indicated they had adjusted their communication practices after receiving MSF. Of these, 56% (48/86) mentioned improvements in teamwork, while 45% (39/86) cited enhanced patient communication. The MSF feedback promoted self-awareness of how anesthesiologists' interactions influenced team function and patient care outcomes, underscoring the consequential validity of MSF in high-stakes environments where communication is critical. These findings emphasize MSF's potential to encourage positive changes in professional conduct.

Roy et al. (2023) investigated the impact of MSF on family physicians' completion of quality improvement plans and found that physicians who received consistent feedback and engaged in facilitated discussions completed all of their quality improvement plans successfully compared to physicians who didn't participate in facilitated discussions (69% vs. 15%). This study revealed that physicians who received actionable, structured feedback and participated in facilitation were significantly more likely to implement improvements in practice. The study demonstrates that MSF, when coupled with facilitation, enhances behaviour change.

The R2C2 model, as described by Sargeant et al. (2018), stands for Relationship Building, Reaction, Content, and Coaching, and is structured to optimize feedback by first establishing trust (Relationship), then exploring the recipient's response (Reaction), reviewing performance details (Content), and concluding with future development and improvement strategies (Coaching). Curran et al. (2024) utilized the R2C2 feedback model within MSF sessions for physicians and found that 78% (78/100) of participants created specific learning goals following their sessions, with 63% (63/100) implementing at least

one of these goals within six months. This structured approach may have contributed to the high rate of goal creation and implementation observed by Curran et al. (2024) highlighting the potential of MSF when combined with targeted coaching to promote actionable professional growth.

In conclusion, these studies collectively support the consequential validity of MSF in fostering meaningful professional growth among physicians. MSF has proven to be a valuable tool for formative assessment, encouraging self-reflection and targeted improvements. While this impact is well documented among physicians, no studies have examined the consequential validity of MSF in pharmacists. Further research is needed to explore and confirm the impact of MSF on consequential validity across other healthcare professions.

2.3 Reliability

Carmines and Zeller define reliability as “the extent to which an experiment, test, or any measuring procedure yields the same results on repeated trials” (1979, p. 12). Garra et al. (2011) state that for MSF to be considered a reliable component of a performance, it must demonstrate consistent results.

Ramsey et al. (1993) conducted one of the earliest studies on MSF reliability, focusing on peer ratings to evaluate physician performance. This study established that at least 11 peer ratings were needed to reach a generalizability coefficient of 0.8. A generalizability coefficient of 0.8 is typically considered sufficient for formative assessment (Peeters & Cor, 2020). This foundational work underscored that, with an adequate number of raters, peer assessments could reliably capture core areas of physician performance, including clinical skills, and communication and professionalism. The study set a precedent for future MSF research by demonstrating the importance of rater numbers in achieving consistent assessment data.

The Physician Achievement Review (PAR) program in Alberta, studied by Hall et al. (1999), also demonstrated high reliability. The PAR achieved high internal consistency with Cronbach’s alpha values above 0.90 for each rater group. This consistency indicates that MSF can reliably capture comprehensive physician performance data across multiple competencies and rater groups.

Violato et al. (2003) investigated MSF reliability among surgeons, demonstrating high reliability with a Cronbach's alpha of greater than 0.9 for peer, non-peer, and patient MSF questionnaires for items measuring competencies such as communication, professionalism, and teamwork. This internal reliability indicates that MSF provides reliable assessments across competencies that are crucial for surgical practice. Violato et al. highlighted that reliable feedback can be achieved by using multiple raters (peers, non-peers, and patients), which minimizes the impact of individual rater bias and variability.

Lockyer et al. (2006) studied the reliability of MSF among anesthesiologists, finding high reliability across three rater groups, with Cronbach's alpha values exceeding 0.90 (0.93 for patients, 0.95 for non-peers, and 0.97 for peers). Through generalizability analyses, Lockyer determined that reliable MSF scores could be obtained with 30 patient raters, eight non-peer raters, and eight peer raters, yielding generalizability coefficients of 0.65 for patients, 0.56 for co-workers, and 0.69 for peers. Generalizability coefficients closer to 0.8 or above are often preferred in high-stakes assessments, such as licensure exams, to ensure dependable outcomes (Peeters & Cor, 2020). However, in exploratory or formative assessments, where the primary goal is to provide developmental insights, generalizability coefficients in the 0.5-0.6 range can still offer valuable guidance for improvement (Peeters & Cor, 2020). This study emphasizes the importance of including sufficient rater numbers to achieve stable and representative feedback.

Archer et al. (2008) demonstrated the reliability of the mini- PAT for trainee physicians, finding it to be a highly reliable tool for assessing core competencies. With a Cronbach's alpha of 0.98, the mini-PAT demonstrated strong reliability across items measuring clinical skills, communication, teamwork, and professionalism. This reliability ensured that the tool provided stable feedback. The study also identified that only eight raters per trainee were necessary to achieve sufficient reliability, making the tool possibly feasible for broad implementation without requiring extensive rater numbers. The inclusion of diverse rater groups, such as senior physicians, nurses, and allied health staff, allowed for a comprehensive view of trainees' competencies across different settings, which is especially valuable given the rotational nature of trainee physicians.

Wright et al. (2012) evaluated the General Medical Council's MSF tool, noting a generalizability coefficient above 0.70. This high generalizability coefficient underscores

the tool's reliability in capturing performance data consistently across various rater types, supporting its use in physician practice for formative assessment. Wright's study confirmed that diverse rater perspectives contribute to more balanced and reliable feedback, which is essential for comprehensive competency evaluations in medical education and practice.

Van der Meulen et al. (2017) assessed the reliability of the INCEPT tool for evaluating physicians' professional competencies. Through generalizability theory, the study confirmed internal reliability, achieving generalizability coefficients above 0.75 for key competencies like "professional attitude" and "patient-centeredness." This study showed that reliable MSF data could be obtained with three evaluations each from peers, resident physicians, and non-peers, supporting INCEPT's reliability as a tool for capturing multidimensional assessments from varied professional relationships with a minimal number of raters.

Across these studies, MSF has proven to be a reliable method for assessing competencies in healthcare professions. While MSF's reliability is well documented in fields such as medicine, and single studies in occupational therapy, and physical therapy, a notable gap exists in pharmacy, where no studies have included formal measurements of MSF reliability. This highlights an opportunity for further research to explore the reliability of MSF in pharmacy practice, thereby expanding its potential application to a broader range of healthcare disciplines.

2.4 Feasibility and acceptability

2.4.1 Number of questions in MSF instruments

The number of questions in MSF instruments varied significantly across studies, reflecting adaptations for different healthcare settings and professional roles. The SPRAT, developed for assessing pediatricians, included 24 items aligned with the "Good Medical Practice" guidelines, covering aspects such as clinical care, interpersonal relationship, and teaching effectiveness (Archer et al., 2005; GMC, 2024). The mini-PAT, adapted from the SPRAT, contained 16 questions designed to assess clinical performance and humanistic skills specifically for early-career postgraduate trainees in the UK (Archer et al., 2008). In a study of occupational therapists, Violato et al. (2009), the number of questions for the peer and self-assessment instrument was 28, and for patients, it was 14. A version of the

mini-PAT used in pharmacy training included 15 questions across three competencies of patient care, personal attributes, and problem solving, tailored for use within a structured postgraduate program (Patel et al., 2009). The INCEPT tool for physicians focused on competencies such as "professional attitude" and "patient-centeredness," and utilized 18 questions for peers, residents, and non-peers (van der Meulen et al., 2017). An MSF tool for surgeons included 34 items for peers, 19 for coworkers, and 39 for patients, capturing a wide range of surgical and interpersonal skills (Violato et al., 2003). The GMC in the UK used a nine- item patient questionnaire and an 18-item colleague questionnaire to provide formative feedback as part of revalidation for practicing physicians (Wright et al., 2012). Finally, the PAR in Alberta, Canada, used separate questionnaires with 44 items for patients, 26 for peers, and 17 for non-physician coworkers to assess competencies relevant to clinical practice (Hall et al., 1999). These diverse questionnaire lengths illustrate the adaptability of MSF tools to specific feedback needs and professional contexts. This variability underscores that the optimal number of questions remains ill defined, likely influenced by the unique demands of each specialty, profession, and context.

The number of questions directly affects the validity and reliability of the MSF process: a sufficient number of well-designed questions can improve content validity and enhance reliability by providing comprehensive coverage of competencies, while too many questions may risk participant fatigue and threaten both validity and inter-rater reliability. Further research to determine the ideal balance of questionnaire length and rater quantity could enhance the effectiveness and precision of MSF tools across various fields.

2.4.2 Time spent completing MSF process

The time required to complete the MSF questionnaires is ideally carefully managed to optimize participation without compromising the feedback's depth. The SPRAT tool for pediatricians, for example, took approximately six minutes per questionnaire, a design choice that contributed to high response rates and minimized the administrative burden (Archer et al., 2005). Although no specific completion time was noted for the mini-PAT, the tool's streamlined 16-item structure suggests it was designed for brief completion, accommodating the high- demand environment of medical training (Archer et al., 2008). In the American Board of Internal Medicine's (ABIM) Patient and

Peer Assessment Module, surveys required roughly eight minutes per response, structured to fit into physicians' ongoing certification requirements (Lipner et al., 2002). The GMC's UK Patient and Colleague Questionnaires took five to ten minutes each, striking a balance between comprehensive feedback and time efficiency (Wright et al., 2012). The time required to complete the MSF process likely impacts its feasibility, yet it remains a relatively understudied aspect of MSF. While balancing thorough assessment with feasibility to achieve a high response rate and minimize the administrative burden on raters is crucial, few studies have examined this aspect of multi-source feedback.

2.4.3 Inclusion of facilitated discussion and action plans

Several MSF studies integrated facilitated discussions and action plans to support reflective practice and encourage professional development based on feedback. The MSF model piloted by Curran et al. (2024) incorporated peer coaching, which significantly enhanced participants' readiness for self-directed learning, as evidenced by improvements on the Readiness for Self-Directed Learning Scale and participant feedback highlighting increased empowerment and goal-setting ability. In the ABIM's Patient and Peer Assessment Module, participants completed a quality improvement plan based on feedback received, an essential component designed to encourage actionable change and ongoing professional development (Lipner et al., 2002). However, it is noteworthy that ratees in this study did not receive facilitated discussions (Lipner et al., 2002). While the mini-PAT in pharmacy did not standardize formal coaching, it included structured feedback sessions that helped participants better understand areas for improvement, though these sessions did not always result in formal action plans (Davies et al., 2013). Although the INCEPT tool did not include formal coaching, it was noted that facilitated discussions of MSF results could deepen reflection, especially when interpreting MSF across different clinical roles (van der Meulen et al., 2017). Similarly, the Family Physician Quality Improvement Plan study by Roy et al. (2023) demonstrated that structured coaching through the R2C2 model allowed physicians to use MSF feedback to co-create actionable improvement plans. The study found that co-constructed quality improvement plans were more likely to be completed than those created solely by the ratee. This approach facilitated meaningful reflection, supported goal setting, and significantly increased the completion rates for quality improvement

plans. These studies highlight the added benefit of coaching and structured follow-up to enhance the impact of MSF on long-term professional growth.

2.4.4 Dropout rates and participation continuity

High retention rates were observed in most MSF studies, with participation strategies designed to minimize dropout. The SPRAT study, for example, achieved high completion rates and minimal dropout (921/1120 proposed raters completed the assessment) due to its concise design, and relevance to professional growth by mapping to professional standards, which kept participants engaged throughout the process (Archer et al., 2005). Violato et al. (1997) studied 28 volunteer physicians from various specialties, where each physician was required to obtain feedback from 30 patient raters, ten peers, and ten non-peers. Retention rates were achieved, with 734 (87.4%) patient questionnaires, 239 (85.4%) non-peer questionnaires and 215 (76.8%) peer surveys returned, underscoring the efficacy of a centralized process for distribution of the questionnaires. The GMC's MSF process implemented reminders, and used clinic staff to support patient survey distribution, minimizing dropout and improving response rates; of the 1067 physicians who agreed to participate, only two dropped out (Wright et al., 2012). These retention strategies highlight the importance of reducing participant burden and integrating supportive measures, which are essential for maintaining engagement in MSF processes across diverse healthcare settings.

However, while effective retention strategies are critical to MSF success, this aspect has been rarely studied or discussed in the MSF literature. Future research could benefit from a deeper exploration of retention strategies to understand how these approaches can further optimize participation by ratees and raters in MSF applications.

2.4.5 Number of required raters

The number of raters required for reliable MSF results varied across studies, reflecting adaptations to different professional contexts and participant availability. In the SPRAT study as few as four raters were needed to achieve reliable feedback on performance, making it feasible to implement MSF without overburdening colleagues or the organization (Archer et al., 2005). Similarly, the mini-PAT for junior physicians

typically required eight raters to ensure reliability, balancing the need for broad perspectives with the feasibility of implementation in structured training programs where colleagues are readily available (Archer et al., 2008).

The ABIM's Patient and Peer Assessment Module required 25 patient surveys and 10 peer surveys to achieve reliable scores for recertification, relying on distribution guidelines to feasibly obtain these responses from established patient and peer networks (Lipner et al., 2002). However, the need for this many respondents could be limiting in smaller or specialized practices. The INCEPT study for physicians required only three peers, two residents, and three coworkers to generate reliable total scores, making it feasible for regular use in clinical departments while still capturing a diverse range of perspectives (van der Meulen et al., 2017). For surgeons, eight to ten peer and non-peer evaluations were needed to assess competencies like communication and professionalism, which proved feasible in larger clinical departments but might present challenges in smaller or specialty-specific teams (Violato et al., 2003).

The UK GMC's MSF tool required the largest number of responses: 34 patient and 15 colleague questionnaires to reliably assess doctors' professional practice (Wright et al., 2012). Though this was made feasible within the National Health Service through structured support and staff involvement, collecting this many responses could be difficult in smaller clinics or low-patient-volume practices. In the case of anesthesiologists, Lockyer et al. (2006) used an MSF program requiring eight medical colleagues, eight coworkers, and 30 patient assessments to gather comprehensive feedback. In the PAR program in Alberta, Canada, physicians were assessed by 25 patients, eight peers, and six non-peers. This structure allowed for a broad evaluation of various competencies and demonstrated good reliability while maintaining feasibility in a standardized provincial system (Hall et al., 1999).

Overall, studies with lower rater requirements, such as SPRAT (Archer et al., 2005) and mini-PAT (Archer et al., 2008), demonstrated greater feasibility across varied settings, while studies requiring more raters, like the ABIM (Lipner et al., 2002) and GMC tools (Wright et al., 2012), benefited from structured logistical support to maintain feasibility.

These findings illustrate that feasible MSF implementation hinges on balancing the

number of required raters with the available resources, as too many raters may create logistical burdens, while too few may affect the reliability and diversity of the feedback provided.

2.4.6 Acceptability of MSF for ratees and raters

Although regulatory bodies can mandate CPD, including tools such as MSF, under ideal conditions, the process would be designed in a manner that would be acceptable to both ratees and raters. One could theorize that if the process is designed with acceptability in mind, less resistance would be encountered, and healthcare professionals could focus on the results and practice improvement.

Examining the acceptability of the MSF process, several themes emerge. Sargeant et al.'s (2005) exploration of family physicians' reactions to MSF reveals that physicians' acceptance of feedback is closely tied to their perceptions of feedback accuracy, credibility, and usefulness. For feedback to be acceptable, it must not only be accurate but also come from reviewers deemed credible by the ratees. Physicians were more likely to accept and use feedback that confirmed their self-perceptions or provided constructive insights. Conversely, when feedback contradicted self-assessment, it often elicited strong emotional responses, such as anger or disappointment, which impeded acceptance. This study underscores the importance of selecting credible reviewers and providing specific, actionable feedback to enhance the acceptability of MSF among physicians.

A study by Mahoney et al. (2019) with pediatric residents further illustrates that structured approaches to gathering feedback, especially in settings where patients and families contribute to the MSF process, can improve acceptability. In particular, outpatient settings compared to inpatient settings, where patient and family availability is higher, yielded a greater volume of feedback (91% completion rate in outpatient compared to 45% completion inpatient). These findings suggest that organizing MSF in a way that accommodates logistical challenges, such as patient availability and response rates, is crucial to ensuring that MSF is both feasible and acceptable. Moreover, patient feedback focusing on specific competencies, like communication, was well received, reinforcing the value of tailored feedback.

Sargeant et al. (2006) highlight the significant role of emotions in determining the acceptability of feedback. Physicians who received feedback in this study incongruent

with their self-perceptions often experienced negative emotions, such as distress, denial, and defensiveness, which interfered with feedback acceptance. Comments like “For about a week I was really depressed” or “...But so far as I know none of my colleagues have ever seen my records so I’m left with this sort of pile of cotton wool that’s, you know, a big criticism, and what do I do about it?” reflect this emotional response and the perception of feedback as lacking credibility. For physicians who eventually accepted and utilized the feedback, facilitated reflection was particularly beneficial. This guided process enabled them to reconcile the feedback with their self-perceptions, regulate their emotions, and use the feedback constructively. However, these findings also underscore potential negative consequences of MSF, including emotional distress and defensiveness, which must be considered within the broader feasibility of the MSF process. Supportive measures, such as facilitated reflection sessions and clear guidance, are essential to mitigate these unintended consequences and improve the acceptability and overall impact of MSF. The concept of "failure to fail" in healthcare professional evaluations is a critical consideration when assessing the consequential validity of an MSF process. "Failure to fail" refers to the reluctance or inability of evaluators to document and address underperformance, even when deficiencies in competencies are evident (Dudek et al., 2005; Sargeant, 2006). This phenomenon can significantly undermine the MSF process by compromising its ability to produce accurate, meaningful outcomes that support professional development and patient safety. Evaluators often hesitate to deliver honest, critical feedback due to systemic barriers such as fear of appeals, lack of sufficient documentation, or inadequate remediation options (Dudek et al., 2005). Consequently, this reluctance can erode the credibility of the MSF process and diminish its perceived validity (Sargeant et al., 2005).

Collectively, these findings suggest that for MSF to be truly acceptable, it should involve credible feedback sources, structured processes that consider logistical challenges, and support mechanisms to help recipients navigate their emotional responses. Designing MSF with these considerations can reduce resistance, thereby enabling healthcare professionals to focus on meaningful practice improvement without the interference of negative emotional reactions.

2.5 Summary of literature and remaining knowledge gaps

The literature on MSF for healthcare professionals highlights a growing consensus on its utility for assessing essential competencies and promoting continuing professional development or continuing professional improvement across various clinical settings. Numerous studies demonstrate that MSF effectively measures competencies such as communication, professionalism, and teamwork, with evidence of reliability and validity for physician usage, and growing evidence for other professions (i.e., occupational therapists, physical therapists, and pharmacists). MSF tools that are aligned with professional standards and grounded in competency frameworks like CanMEDS or the GMC's Good Medical Practice guidelines exhibit strong content and construct validity, ensuring assessments are relevant to the practical demands of each profession (Frank et al., 2015; GMC, 2024). Potential exists for Canadian pharmacy MSF tools to be aligned with NAPRA standards and competencies (NAPRA, 2022, 2024). The consistency of high ratings from various rater groups further supports MSF's construct validity, affirming its capacity to reliably capture essential competencies.

Response process validity is also demonstrated in physician studies and one study of occupational therapists, as MSF items show high engagement and low rates of "unable to assess" responses, indicating that items are generally well-targeted to observable behaviours (Hall et al., 1999; Lockyer et al., 2006; van der Meulen et al., 2017; Violato et al., 2009; Wright et al., 2012). Additionally, evidence from multiple studies supports MSF's potential consequential validity, with some healthcare professionals reporting intentions to enact meaningful changes in their practices based on feedback, particularly in areas such as communication and patient care (Curran et al., 2024; Fidler et al., 1999; Hall et al., 1999; Lockyer et al., 2003b; Lockyer et al., 2006; Roy et al., 2023; Violato et al., 2003).

Despite these strengths, several knowledge gaps remain. The literature on MSF in pharmacy is sparse, especially regarding formal reliability assessments and the unique competencies required in pharmacy practice. Limited research exists on the optimal number of MSF questions to be included in a questionnaire as well as the number of each type of rater that is needed to provide reliable and usable feedback to the ratee. There is also a need for more comprehensive studies on the long-term impact of MSF on professional growth across healthcare fields, particularly in pharmacy, as well as the impact on patient

outcomes. There is little in the literature describing strategies to ensure feasibility of the process for ratees, raters and regulatory or educational organizations wanting to use MSF. Few studies have explored the acceptability of MSF as a component of CPD, or how to enhance its acceptability, without compromising validity and reliability (Sargeant et al., 2005; Sargeant, 2006; Mahoney et al., 2019). To address these gaps, a pilot study on pharmacists is essential prior to wider implementation. Such a study would provide crucial insights into the feasibility, acceptability, validity, and reliability of MSF in this context, ensuring that the tool is well-suited to the specific needs of pharmacy practice.

Chapter 3 Research question, purpose, and objectives

Research Question:

What is the validity, reliability, acceptability, and feasibility of an MSF process developed for hospital/healthcare-system pharmacists?

Purpose:

The purpose of this study is to conduct a pilot test of an MSF process for hospital/healthcare- system pharmacists to assess the validity, reliability, feasibility, and acceptability of the process. **Objectives:**

1. Establish the validity and reliability of the developed MSF process.
2. Assess the feasibility and acceptability of the developed MSF process.

Chapter 4 Methods

4.1 Study Design and Ethical Considerations

To answer the research questions, an MSF process was developed and pilot-tested to assess the validity, reliability, feasibility, and acceptability in hospital/health-care system pharmacists (ratees) and their raters. The set of questions was developed as described in 4.3 below. These questions were then used to create an online MSF questionnaire delivered through SurveyMonkey®. Hospital/healthcare-system pharmacist participants (see section 4.2.1 for inclusion criteria), who are hereafter referred to as ratees, were recruited via voluntary sampling through an email recruitment process (**Appendix C1**). The student investigator delivered a one-hour virtual presentation to hospital/healthcare-system pharmacists across the province to inform and recruit pharmacists. Pharmacists who consented to participate in the study were directed to complete a self- assessment using the MSF questionnaire and to recruit eight peer and eight non-peer raters (**Appendix C2, Appendix C3**). The peer and non-peer raters completed the MSF questionnaire to provide ratings of the ratees. The ratee was then sent a collated report containing their self- assessment, peer, and non-peer ratings (**Appendix D**). At the end of the collated report, ratees were given their average score across three competencies guided by the NAPRA entry to practice competencies (NAPRA 2024). After receiving a collated report, the ratee took part in a facilitated discussion about their MSF report led by the student investigator where the focus was for the ratee to create action plans based on their multisource feedback (**Appendix E**). Both ratees and peer/non-peer raters completed a post-MSF process survey, which along with the MSF questionnaire results helped to establish the validity, reliability, feasibility, and acceptability of this process. A certificate of ethics approval was obtained on November 24, 2023, from the University of Saskatchewan Behavioural Research Ethics Board (ID 4342). An ethics amendment was approved on March 4, 2024, to allow ratees with a minimum of three peer or three non-peer raters to participate (**Appendix F**).

4.2 Study population

4.2.1 Inclusion criteria

Study participants, “ratees”, were licensed pharmacists practicing in Saskatchewan who work in a hospital, ambulatory, or primary care environment outside of community pharmacy. To ensure that participating pharmacists had sufficient interprofessional relationships with non-peers to provide useful and constructive ratings, study participation was limited to pharmacists who provide direct patient care for at least approximately 20% of their scheduled work time. Eligibility for inclusion was self-determined by participating pharmacists. Because there is no unifying definition of direct patient care in pharmacy (Harris et al., 2014) the student investigator chose a definition of pharmaceutical care as pharmacists who work directly with patients and other healthcare professionals to prevent, identify, and resolve drug-related problems (Hepler & Strand, 1990). According to the SCPP 2023 annual report, of the 1810 pharmacists practicing in Saskatchewan, 364 (20.1%) self-identified their primary practice area as hospital pharmacy (SCPP, 2023). Based on MSF implementation guidelines (Lockyer & Sargeant, 2017, p.11) the goal sample size for this MSF pilot study was between 10-20 study participants.

Supported by literature advocating for self-selected raters, participants were permitted to choose their own peer and non-peer raters (Ramsey et al., 1993, 1996; van der Meulen et al., 2019). Peers were defined as pharmacist colleagues who knew the study ratee well enough to provide constructive, thoughtful feedback and who currently work with or have worked with the ratee in the past year. Non-peers were defined as other licensed healthcare professionals (e.g. pharmacy technicians, physicians, nurses, dietitians, physical therapists, occupational therapists) who work with the ratee and can provide constructive, thoughtful feedback and currently work or have worked with in the past year. Based on published MSF literature, each ratee was asked to select eight peer and eight non-peer raters to ensure a sufficient level of reliability and generalizability (Donnon et al., 2014; Lockyer, 2013; Lockyer & Sargeant, 2017; Lockyer & Sargeant, 2022; Patel et al., 2009). The minimum number of rater responses required to complete the study was three peer and three non-peer raters.

Based on ratee recruitment numbers during the study, an ethics amendment was filed to include ratees if they could obtain at least three peer or non-peer raters (for a total of three raters) as opposed to three peer and non-peer raters (for a total of six raters). This was done to include

ratees data especially as it relates to feasibility (e.g. why were they unable to obtain the minimum number of peer/non-peer raters). Ratees who met these criteria were contacted via email to consent to their inclusion in the study.

4.2.2 Exclusion criteria

The exclusion criteria were self-determined by the participants, as pharmacists were asked to evaluate their practice setting and patient care responsibilities to confirm their eligibility for inclusion in the study. Those whose primary practice area was outside hospital, ambulatory, or primary care environments, such as community pharmacy, or who did not provide sufficient direct patient care, were instructed to exclude themselves from participation. Pharmacists whom the student investigator had a formal supervisory relationship with were excluded from the study.

4.2.3 Recruitment

Using voluntary response sampling (Purna Singh et al., 2023), the MSF invitation and study overview (**Appendix C1, Appendix C2**) were distributed to Saskatchewan Health Authority (SHA) hospital and healthcare-system pharmacists on December 1, 2023. This dissemination was facilitated by pharmacy directors within the SHA, who emailed the invitation directly to the pharmacists under their supervision. In one instance, where a director declined to send the invitation, an email list of all pharmacists under that director, maintained by the HR department, was utilized to ensure those pharmacists received the invitation. Additionally, the student investigator delivered a one-hour virtual presentation on MSF and details of the study to hospital pharmacists across the province. The invitation for this virtual presentation was disseminated by the provincial pharmacy education committee to ensure broad awareness and participation. Pharmacists who were interested in participating in the study first emailed the student investigator to request the consent form. Upon emailing back their signed consent form, they were sent the MSF questionnaire link for their self-assessment, along with an email template to recruit peer and non-peer raters. (**Appendix C2, Appendix C3**). The MSF self-assessment was delivered to ratees via a SurveyMonkey® link sent to their email. After selecting their raters, ratees then emailed a separate SurveyMonkey® link to each rater to complete the MSF assessment. An electronic questionnaire approach was selected due to the ability to reach respondents from around the province at no cost as access to SurveyMonkey® was provided through the University of Saskatchewan. Additionally, by using SurveyMonkey® there are

potentially fewer errors with data input, and the relative speed with which the survey can be disseminated, completed, and analyzed was beneficial (Ball, 2019; Hoonakker & Carayon, 2009). The ratee self-assessment was asked to be completed within 30 days of study enrollment. Peers and non-peers were asked to provide ratings within 30 days of being emailed by the ratee. Ratees were asked to send a reminder to their raters by day 15 to complete their rating. The student investigator did not confirm if this reminder was completed. If the ratees self-assessment was not completed and/or the ratee received no ratings from peers/non-peers, they were assumed to have withdrawn consent to participate in the study.

4.3 MSF Questionnaire Development

Prior to this study, the S CPP Competency Assurance Task Force directed a consultant working for S CPP (N.W.) to assist with the creation of a set of questions which could be used for MSF. Possible questions were drawn from the literature and sorted by competency. These questions were then reviewed by three clinical faculty members of the University of Saskatchewan College of Pharmacy and Nutrition, who suggested additions, deletions and modifications and offered comments. The questions were modified based on those suggestions. A pre-pilot focus group of key pharmacy stakeholders which included a practicing hospital pharmacist, a practicing hospital pharmacy technician, a clinical support pharmacist, a manager of pharmacy practice, and an executive director of clinical pharmacy, was formed and asked to review the questions for face and content validity. Feedback was obtained on the following: clarity, errors, readability, acceptability, and appropriateness of the type and format of the questions. The pre-pilot focus group was also asked whether they thought any important questions were missing from the questionnaire. After the pre-pilot focus group review, there were a total of 18 questions selected for the final questionnaire. The maximum number of questions was limited to 18 to balance the amount of feedback obtained by ratees but also to consider if the acceptability and feasibility of the questionnaire was appropriate. To further enhance the validity and feasibility of the data collected, the questions were mapped to NAPRA Professional Competencies for Pharmacists and Pharmacy Technicians at Entry to Practice in Canada (NAPRA, 2024) (**Appendix G**). By mapping MSF questions to an established competency framework like NAPRA's, the assessment is more likely to measure the intended constructs (van der Meulen et al., 2017). This systematic approach helped to ensure that the

feedback was rooted in well-defined professional competencies, providing a more accurate measure of the ratee's abilities. The three competencies of interest the questions were mapped to were: 1) providing care - clinical care, 2) communication and collaboration, and 3) professionalism. To map the questions the primary investigator (Dr.Y Shevchuk) and student investigator (Jeff Herbert) individually mapped each question to one of the three NAPRA competencies and the results were compared. In the event of a disagreement, both primary investigator and student investigator would discuss to achieve consensus. At the time, the 2014 competencies were in use, but were under revision (NAPRA, 2014). Mapping was done based on an early draft of the revisions which was obtained from NAPRA (S. Marshall, personal communication, October 5, 2023). NAPRA published the revised competencies in October 2024. The study investigators both remapped the competencies to ensure the original mapping was still relevant. Upon remapping it was discovered that question 5 had incorrectly been mapped to the wrong competency and therefore was removed from the Professionalism category. The questionnaire for ratee self-assessment can be found in **Appendix H**, while the questionnaire for raters can be found in **Appendix I**. The questions were the same for both ratee self-assessment and non- peer/peer raters with the only difference being demographic questions and phrasing.

For each question, raters and ratees were asked to select a response on a Likert scale ranging from 1 (strongly disagree), 2 (disagree), 3 (neither agree nor disagree - neutral response), 4 (agree) to 5 (strongly agree) which indicated agreement with the statement provided. Raters were invited to provide constructive feedback by completing a free-text box associated with each question to capture both positive comments and suggested areas for future development of the ratee. During the self-assessment, ratees were encouraged to also complete free-text box comments to provide material for self-reflection. Free-text box comments were included as previous studies have shown that narrative comments can be valuable and informative in addition to numerical responses (Overeem et al., 2010a; Sargeant, 2015; van der van der Leeuw et al., 2013). An option for "unable to assess" was included with all statements based on MSF implementation guidelines (Lockyer & Sargeant, 2017). Likert scale labels were placed in a vertical format to reduce the risk of left-sided selection bias (Chyung et al., 2018). To maintain a consistent visual distance between responses, ratees and raters were advised to use a computer rather than a mobile device, as Weijters et al. (2020) found that varying response distances in surveys could influence answer extremity. The questionnaire needed to be completed in its

entirety for it to be submitted, although it could be completed in multiple sittings. An “unable to assess” option was provided to allow respondents to complete the survey even if they could not complete an individual question. Raters were advised that their ratings and comments would be de-identified before being collated and returned to the ratee (**Appendix I**).

Ratee participants were asked to identify how long they had practiced as a pharmacist, credential(s) obtained, rural vs. non-rural primary practice area, and their names on the self-assessment. Peer/non-peer raters were asked to identify the ratee they were providing feedback on, and their profession (e.g. physician, nurse, physical therapist). Both raters and ratees were instructed to record the time it took to complete the questionnaire.

4.4 Collated report

Ratees received their collated report via email in a Microsoft® Word document after completing the self-assessment and if they had sufficient responses from their raters. To prepare the report, the student investigator extracted the ratee's rating information from SurveyMonkey® into Microsoft® Excel. The data was then manually transferred onto a template created by the investigator to generate the final collated report. The report contained each statement in the MSF questionnaire with their self-assessment ratings alongside peer and non-peer ratings displayed in bar graph format (**Appendix D**). Narrative comments were also included in the collated report and separated between peer and non-peer raters and self-assessments. Ratees were given their average score across three competencies (providing care: clinical care, communication and collaboration, and professionalism) separated by self-assessment, overall peer/non-peer ratings, and separate peer and non-peer ratings and displayed graphically. At the end of the collated report overall peer/non-peer ratings were displayed graphically for each competency. These collated reports were modeled after best practice found in the MSF implementation guidelines by Lockyer and Sargeant (2017).

4.5 Facilitated discussion

After the ratees received their collated report, they were instructed to book a 30 to 60 minute appointment with the student investigator to discuss their MSF report and to create up to three action plans with at least one SMART (specific, measurable, attainable, relevant, and time-bound) goal targeting feedback from the MSF report (**Appendix C2**). The facilitated discussion

was completed remotely via WebEx® within 7-14 days of the ratee receiving their collated report. In order to provide the facilitated discussion, the student investigator contacted Dr. J Lockyer, a skilled MSF facilitator identified from the review of literature. She agreed to provide a virtual one-hour training session, which occurred on October 2, 2023, as well as to assist with the development of an R2C2 guide (**Appendix E**). The student investigator used the guide to facilitate the discussion of the MSF report with the ratees. (Kriz et al., 2024; Lockyer et al., 2020, 2023; Sargeant et al., 2018).

4.6 Data Management

Electronic data, extracted from SurveyMonkey, was stored in a University of Saskatchewan DATASTORE folder. The data was located on the shared network drive through Dr. Yvonne Shevchuk's faculty access. DATASTORE is a University of Saskatchewan-approved data storage platform. Data was de-identified prior to analysis by removing personally identifiable information and each ratee was assigned a participant ID number to each set of data (i.e. ratees all receive a unique participant ID number). A master list containing names and participant ID numbers was only available to the student investigator and stored in a separate file in DATASTORE. The identities of the raters were anonymous and not known to the investigators or advisory committee, whereas the names of the ratees were known to the student investigator in order to collate the individual reports and provide them to the ratees, and provide the facilitated discussion and coaching.

4.7 Post-MSF process survey

The post-MSF process survey was developed by the student investigator based on existing tools assessing MSF feedback (Ashworth et al., 2020; Björklund et al., 2022; Corbo et al., 2006; Patel et al., 2009). Eleven Likert-scale questions were developed for the raters and thirteen Likert-scale questions were developed for the ratee's using a scale ranging from 1 (strongly disagree), 2 (disagree), 3 (neither agree nor disagree – neutral response), 4 (agree) to 5 (strongly agree) (**Appendix I, Appendix J**). Studies by Corbo et al. (2006) and Patel et al. (2009) utilized the Osgood Semantic Differential Scale (OSDS) as opposed to a Likert scale to evaluate the feasibility and acceptability of MSF in pharmacists. Based on their work, the OSDS was included in this study to evaluate six bipolar scales using a seven-point rating scale where seven

represented the positive pole. The bipolar adjectives chosen were based on the objectives of the study (e.g. feasible/infeasible, acceptable/unacceptable), previous literature (e.g. fair/unfair), and feedback from the advisory committee (e.g. positive/negative). After the development of the initial round of Likert-scale and OSDS questions, they were reviewed by the advisory committee for clarity, errors, readability, acceptability, and appropriateness of the type and format of the questions. At the end of the post-MSF survey participants were asked two free text questions on the clarity, wording, and necessity of each MSF statement as well as any positives, negatives, or areas of improvement of the MSF process (e.g. recruitment, questionnaire). Free-text responses (**Appendix K**) were analyzed and themed into four categories (positive feedback, negative feedback, not applicable, and suggested areas of improvement) using a structured tabular approach (Robinson, 2022). Verbatim free-text responses are located in **Appendix L**. The post-MSF process survey was made available immediately to the raters when they completed rating the ratee as it was contained in the same SurveyMonkey® survey. If raters were utilized by multiple ratees, instructions in the survey indicated they were to complete the post- MSF process survey only once. The post-MSF process survey (**Appendix J**) was made available to ratees when they received the final collated report and had completed the facilitated discussion component with the student investigator. To assess the feasibility of the MSF process, ratees and raters were asked to record the amount of time it took to complete the MSF questionnaire, excluding the post-MSF survey (Lopetegui et al., 2014).

4.8 Data Analysis

Quantitative data collected from SurveyMonkey® was exported to The Statistical Package for Social Science (SPSS). SPSS software version 28.0 was used by the student investigator to collate and analyze the data collected. The SPSS package provided by the University of Saskatchewan could not perform the multiple imputations required to analyze Cronbach's alpha. A University of Saskatchewan pharmacy professor not on the research committee performed multiple imputations using SAS (Statistical Analysis System) version 9.4, which was not available to the student investigator. All provided responses were included for analysis. For each section of the questionnaire (ratee self-assessment, rater assessment, post-MSF rater questionnaire, and post-MSF ratee questionnaire), descriptive statistics were used to compare and contrast the data. Specifically, the mean, SD, and range of the Likert scale response

to each question were calculated for the ratee self-assessments scores and rater assessments. The mean, SD, and range of the Likert scale response and OSDS scales were calculated for the post MSF-process survey for raters and ratees. Likert-scale data was treated as continuous for parametric testing. An independent T-test, a statistical method used to compare the means of two independent groups, was conducted to assess differences in survey responses between peer raters and non-peer raters in the post-MSF process survey. This analysis aimed to determine whether there were statistically significant differences in perceptions or experiences of the MSF process between these two groups. Demographic data for both raters and ratees was reported to assess the generalizability of the pilot study population.

4.8.1 Validity and Reliability Analysis

The most recent Standards for Educational and Psychological Testing (American Educational Research Association, 2014) defines validity as “the degree to which evidence and theory support the interpretations of test scores entailed by proposed uses of tests”. Validity refers to how well we can trust the interpretation of results for a given assessment (Cook & Beckman 2006). Although validity is a unified concept, it is informed by evidence from various sources, such as content validity, construct validity, and response process validity, to enhance the rigor of the overall assessment (Kane, 2004):

- Content. Refers to the relationship between the content in a test and the attributes or constructs it intends to measure (Kleinheksel et al., 2020). Content refers to the themes, wording, and format of the items, tasks, or questions on a test. Content validity was provided through the pre-pilot focus group feedback on the questionnaire, advisory committee feedback on the questionnaire, and the review of literature, which ensured the inclusion of relevant competencies.
- Construct: Construct validity refers to how well a measure assesses the underlying theoretical construct it is intended to measure (American Educational Research Association, 2014). In this study, construct validity was assessed by comparing the mean scores of ratees, peers, and non-peers on the MSF assessments to the results of previous MSF studies, both general and pharmacy specific. To support construct validity, whether the distribution of scores aligns with established trends in the literature was evaluated. For example, previous MSF studies have demonstrated consistently high scores, often skewed toward the upper end of the rating scale (Donnon et al., 2014). This trend, which

reflects biases like self-perception and selection biases, was compared to the findings from this study to determine the extent to which our results mirror those in other contexts.

- Response processes: Response process validity examines the alignment between how an assessor and learner understand the goals of an assessment, how they engage with items within an assessment, and whether there is a shared understanding of the assessment target (i.e. skill, competency, or behaviour of interest) (Shankar et al., 2022). This aspect of validity was evaluated in the current study through the analysis of the number of question responses that were “unable to assess”. An ‘unable to assess’ response rate of 20% or higher for any given statement may indicate that the statement is not assessable by the raters and requires revision or deletion (Lockyer, 2003a; Violato et al., 2003)
- Relationship to external variables: This aspect of validity refers to the relationship with other instruments assessing the same attribute (American Educational Research Association, 2014). This was not explored in the current study.
- Consequential: This aspect of validity refers to the overall impact of the assessment process (American Educational Research Association, 2014). This was explored through analysis of Likert-scale questions in the post-MSF process survey for ratees and raters. Specifically for raters “I believe the MSF questionnaire is an important activity for the development of my pharmacist colleagues' communication, collaboration, and professionalism” and “I expect the professional performance of my pharmacist colleague to improve as a result of the MSF process”. For ratees consequential validity was assessed through the questions “I believe the MSF questionnaire is an important activity for the development of my communication, collaboration, and professionalism” and “I expect my professional performance to improve as a result of the MSF process”, and “The feedback I have received through the MSF process has increased my awareness and ability to self-assess”.

Carmines and Zeller define reliability as “the extent to which an experiment, test, or any measuring procedure yields the same results on repeated trials” (1979, p. 12) and validity as the extent to which an indicator “measures what it purports to measure” (1979, p. 13). Garra et al. (2011) state that for MSF to be considered a reliable component of a performance, it must demonstrate consistent results. This study's reliability was measured by calculating the

coefficient alpha (α), also known as Cronbach's alpha, for responses provided by the peer raters as compared to non-peer raters. Cronbach's alpha is the most common and acceptable measurement to test for internal consistency of a questionnaire and that consists of Likert scales and multiple items (Kothari, 2004; Norman, 2010). The acceptable Cronbach's alpha is 0.70 and above. A Cronbach's alpha value of less than 0.60 is generally considered weak and this indicates that the data is not reliable and not consistent (Tavakol & Dennick, 2011). Because of the option to choose "unable to assess" in the rating process, multiple imputation was used to avoid listwise deletion in the calculation of the Cronbach's alpha.

4.8.2 Feasibility and Acceptability Analysis

The study reported the number of ratees, and peer, and non-peer raters who completed or dropped out of the study. The total number of ratees was derived from the number of pharmacists who completed the consent form to participate. Ratees who did not complete the study after completing the consent form were considered to have dropped out of the study. Ratees who were unable to recruit at least 3 peer and non-peer raters were considered to have dropped out of the study. This was to ensure there was sufficient data to analyze and to preserve the anonymity of raters. The questionnaire did not include an option to submit responses unless it was completed in its entirety, so feasibility was unable to be assessed through missing data on the questionnaire. However, the questionnaire did include an option for raters to select "unable to assess" for each statement. The number of "unable to assess" responses was analyzed alongside free-text comments to determine if the questions were worded poorly, or if raters were unable to properly assess the ratees. Additionally, statements that were unable to be assessed also contribute to assessing the response process validity of the MSF process. Feasibility and acceptability were further assessed by capturing the amount of time it took to complete the MSF process for raters and ratees.

Feasibility and acceptability were captured through a post-MSF process survey for raters with the eleven Likert-scale questions such as "The amount of time I spent completing the MSF questionnaire was not considered burdensome". In addition, OSDS questions were utilized to ascertain the views and/or attitudes towards the MSF process using six bipolar adjectives (infeasible - feasible, unacceptable - acceptable, etc.) using a seven-point rating scale (**Appendix D**).

A post-MSF process survey was created for ratees with thirteen Likert-scale questions

such as “The feedback I have received through the MSF questionnaire and my raters have increased my awareness and ability to self-assess” (**Appendix J**). In addition, an OSDS question was utilized asking the views and/or attitudes towards the MSF process using six bipolar adjectives (infeasible - feasible, unacceptable - acceptable, etc.) using a seven-point rating scale (**Appendix J**).

Information on ratees action plans was obtained from facilitated discussions. This included if a minimum of one action plan was completed by the participant, the number of action plans per participant, how many action plans targeted their lowest scoring competency from the collated report, and finally if their action plans followed a SMART format. Minimal instructions were provided to participants other than that the above information would be captured. Action plans were considered SMART if they contained one or more components of the SMART format. The student investigator collected general reaction to the feedback by the ratee during the facilitated discussion as described by the R2C2 guide (**Appendix E**). Lastly, the student investigator gathered data on resources or barriers ratees required to implement their action plans and this data was themed by the student and primary investigator.

4.8.3 Thematic Analysis of Open-ended Questions (Appendix K)

This study utilized a pragmatic approach to thematic analysis of the open-ended questions (Robinson, 2022). This approach was chosen due to the limited number of open-ended questions and themes being analyzed and the required research expertise. In alignment with previous pharmacy MSF literature (Patel et al., 2009) the themes chosen to analyze were positive and negative responses to the MSF pilot as well as suggestions for improvement. Any comment that said something good or promising about the process was classified as positive. A comment that indicated something bad about the process or negative was classified as negative. If the comment provided any recommendation for a change or alteration to the process, it was classified as a suggestion for improvement. To minimize researcher bias, the thematic analysis was performed by two individuals: the student investigator (J. Herbert) and the primary investigator (Dr. Y. Shevchuk). The student investigator entered each open-ended question response into Microsoft Excel®. These responses were reviewed by the student investigator and primary investigator independently and tabulated to one of the pre-specified themes while making note of any responses that did not fit into the pre-specified themes. If an open-ended response contained more than one theme it was tabulated into all appropriate pre-specified themes. The primary

investigator and student investigator then compared the results. Inter-analyst agreement was calculated by adding the total number of agreements and disagreements in theming between the student investigator and the primary investigator. Where the theming of a response resulted in a disagreement, an advisory committee member (Dr. S Gerwing) acted as the tiebreaker. Final frequencies for each theme are reported in the manuscript.

Chapter 5 Results

5.1 Demographics and Response Rate

The MSF pilot study invitation was sent to pharmacists by the student investigator via SHA pharmacy directors or SHA email list. Only 2.5% of hospital pharmacists in Saskatchewan completed the MSF process. Although ten pharmacists initially consented, one withdrew due to challenges in finding peer and non-peer raters and they did not provide further context when followed up by the student investigator. Two of the nine ratees were included in the study only after an ethics amendment (i.e. they had at least either three peer or three non-peer raters, but not both). They did not provide any commentary on why they were unable to find a sufficient number of raters when followed up with by the student investigator.

The demographics of the ratees are reported in Table 5.1.

Table 5.1 Ratee demographics

Ratees (N=9)		
Years as a practicing pharmacist, n (%)		
	<5	3 (33.3)
	5-10	5 (55.6)
	11-15	1 (11.1)
	16-20	0
	>20	0

Credentials, n (%)		
	Bachelor of Science in Pharmacy (BSP)	2 (22.2)
	PharmD (first degree)	1 (11.1)
	BSP + Accredited Canadian	6 (66.7)
	Pharmacy Residency	
Primary practice area, n (%)		
	Urban (Saskatoon, Regina, Prince Albert)	7 (77.8)
	Rural	2 (22.2)
How long did it take you to complete this self-assessment? (minutes), mean (range)		
		22 (5 - 45)

Almost all ratees (88.9%) have been practicing for 10 years or fewer. Over half the ratees (66.7%) had completed an Accredited Canadian Pharmacy Residency, in addition to their undergraduate degree. The majority (77.8%) of ratees practiced in urban hospital settings in Saskatchewan (Saskatoon, Regina, Prince Albert). It took a mean time of 22 minutes (5-45) to complete the self-assessment.

Demographics of raters who completed the MSF process are reported in Table 5.2.

Table 5.2 Rater demographics

Raters (N=97)		
Occupation, n (%)		
	Dietitian	3
	Nurse	16

	Nurse practitioner	2
	Pharmacist	43
	Pharmacy technician	16
	Pharmacy assistant	2
	Physician	13
	Social worker	0
	Occupational therapist	0
	Unit clerk	1
	Clinical research coordinator	1

Ninety-seven peer and non-peer raters completed the MSF process in this study. The total number of raters contacted by the ratees was unable to be determined as this study did not ask participants to record how many raters they asked to participate. Two peer raters were excluded from the study as they recorded the student investigators' name as the ratee they assessed.

Overall, there were slightly more non-peer raters than peer raters (54/97, 55.7%). Nurses and nurse practitioners (18/54, 33.3%), pharmacy technicians and assistants (18/54, 33.3%), and physicians (13/54, 24.1%) made up the majority of non-peer raters who completed the MSF process. A very small fraction (2/54, 3.7%) of raters fell into the “other” category. After agreement between the student and primary investigator, they were then placed into an occupation category that fit best (e.g. rater entered nursing clinical coordinator under “other” category and was placed into the nursing category for data analysis).

5.2 Self-assessments

Results of the ratee self-assessment are presented in Table 5.3.

Table 5.3 Self-assessment scores

Likert scale: 1 (strongly disagree) 2 (disagree) 3 (Neither agree nor disagree - neutral response) 4 (agree) 5 (strongly agree)

Ratees (N=9)		
Self-assessment question	Mean score (SD) (range)	Number of narrative comments
Question 1: "I place the best interests of the patient as a principal priority"	4.67 (0.47) (4-5)	5
Question 2: "I engage the patients in shared decision making"	4.33 (0.47) (4-5)	7
Question 3: "I respect patients' informed choices regarding healthcare decisions even if they conflict with my own"	4.22 (0.42) (4-5)	6
Question 4: "I demonstrate respect and am non-judgmental of patients and co-workers regardless of gender, sexual orientation, ethnicity, or medical condition/disability"	4.33 (0.47) (4-5)	5
Question 5: "I keep my knowledge and skills up to date"	4.11 (0.57) (3-5)	7
Question 6: "I respect professional boundaries"	4 (0.67) (3-5)	6
Question 7: "I maintain the confidentiality of information"	4.33 (0.47) (4-5)	7
Question 8: "I identify and resolve drug therapy problems as a priority"	4.77 (0.41) (4-5)	5

Question 9: “I identify and resolve drug therapy problems in a timely and efficient manner”	4.33 (0.67) (3-5)	6
Question 10: “I make recommendations that are evidence-informed”	4 (0.67) (3-5)	5
Question 11: “I accept responsibility for my professional recommendations and actions”	4.33 (0.47) (3-5)	6
Question 12: “I assume responsibility for monitoring patient's response to therapy”	3.77 (0.63) (3-5)	7
Question 13: “I verbally communicate my recommendations to both patients and colleagues in a clear and concise manner”	4.22 (0.42) (4-5)	7
Question 14: “My written documentation facilitates collaboration and continuity of care (accurate, concise, and timely)”	4.22 (0.63) (3-5)	7
Question 15: “I establish and maintain positive relationships with others to support collaborative care”	4.11 (1.20) (1-5)	6
Question 16: “I effectively manage conflict within the team”	3.33 (0.82) (2-4)	6
Question 17: “I manage my stress effectively in the workplace”	3.77 (0.63) (3-5)	5
Question 18: “OVERALL, how confident am I with medication and medication-use expertise?” *	4.14 (0.35) (4-5)	7

Self-assessments scores by NAPRA competency	Mean (SD) (range)	Narrative comment Mean per competency
Providing care: Clinical care	4.22 (0.67) (3-5)	5.75
Professionalism	4.24 (0.61) (3-5)	5.72
Communication and collaboration	4.04 (0.84) (1-5)	6.60

*N=7, two respondents chose “unable to respond”

The highest mean self-assessment score was 4.77 (SD = 0.41) (question 8), while the lowest mean self-assessment score was 3.33 (SD = 0.82) (question 16). For NAPRA competencies, providing care: clinical care had a mean self-assessment score of 4.22 with a range of 3 - 5 and standard deviations of 0.67. Professionalism had a mean self-assessment score of 4.24 with a range of 3-5 and a standard deviation of 0.61. For the NAPRA competency of communication and collaboration, the mean self-assessment score was 4.04 (Range = 1-5, SD = 0.84).

5.3 Rater assessments

Only one ratee (1/9, 11%) obtained eight peer and eight non-peer raters to rate them. Two ratees who completed the MSF process had no peer raters, only non-peer raters. The mean number of raters per ratee was 6.67, while the mean number of peer and non-peer raters was 4.33 and 5.77 respectively.

The results of the rater assessments are located in Table 5.4.

Table 5.4 Rater assessment scores

Likert scale: 1 (strongly disagree) 2 (disagree) 3 (Neither agree nor disagree - neutral response) 4 (agree) 5 (strongly agree)

Rater assessments (peer and non-peer) (N=97)									
				(Peer)N=43			(Non-peer) N=54		
Rater assessment question	Total mean score (SD) (range)	Total number of narrative comments	Unable to assess (%)	Peer total mean score (SD) (range)	Peer number of narrative comments	Unable to assess (%)	Non-peer total mean score (SD) (range)	Non-peer number of narrative comments	Unable to assess (%)
Question 1: “This pharmacist places the best interests of the patient as a principal priority”	4.73 (0.48) (2-5)	41	0	4.77 (0.42) (4-5)	24	0	4.50 (0.43) (4-5)	17	0
Question 2: “This pharmacist engages the	4.56 (0.43) (4-5)	38	21 (21.88%)	4.48 (0.50) (4-5)	20	10 (23.25%)	4.69 (0.49) (4-5)	18	11 (20.75%)

patients in shared decision making”									
Question 3: “This pharmacist respects patients’ informed choices regarding healthcare decisions even if they conflict with their own”	4.59 (0.50) (4-5)	26	15 (15.63%)	4.56 (0.50) (4-5)	12	8 (18.64%)	4.63 (0.57) (3-5)	14	7 (13.20%)
Question 4: “This pharmacist demonstrates	4.67 (0.64) (1-5)	27	0	4.67 (0.53) (3-5)	17	0	4.69 (0.72) (1-5)	10	0

respect and is non-judgmental of patients and co-workers regardless of gender, sexual orientation, ethnicity, or medical condition/disability”									
Question 5: “This pharmacist keeps their knowledge and skills up to date”	4.80 (0.40) (4-5)	42	3 (3.13%)	4.68 (0.47) (4-5)	25	1 (2.32%)	4.90 (0.30) (4-5)	17	2 (3.77%)
Question 6:	4.67	20	0	4.46	11	0	4.82	9	0

“This pharmacist respects professional boundaries”	(0.49) (3-5)			(0.55) (3-5)			(0.38) (4-5)		
Question 7: “This pharmacist maintains the confidentiality of information”	4.74 (0.46) (3-5)	16	3 (3.13%)	4.61 (0.49) (4-5)	12	1 (2.32%)	4.84 (0.42) (3-5)	4	2 (3.77%)
Question 8: “This pharmacist identifies and resolve drug therapy problems as a priority”	4.78 (0.44) (3-5)	22	1 (1.04%)	4.79 (0.41) (4-5)	13	1 (2.32%)	4.78 (0.45) (3-5)	9	0
Question 9:	4.76	24	2 (2.08%)	4.66	17	1 (2.32%)	4.84	7	1 (1.88%)

“This pharmacist identifies and resolve drug therapy problems in a timely and efficient manner”	(0.50) (2-5)			(0.48) (4-5)			(0.50) (2-5)		
Question 10: “This pharmacist makes recommendations that are evidence-informed”	4.75 (0.43) (4-5)	24	1 (1.04%)	4.64 (0.49) (4-5)	16	0	4.84 (0.36) (4-5)	8	1 (1.88%)
Question 11: “This pharmacist	4.69 (0.50) (3-5)	18	1 (1.04%)	4.63 (0.49) (4-5)	10	1 (2.32%)	4.75 (0.52) (3-5)	8	0

accepts responsibility for their professional recommendations and actions”									
Question 12: “This pharmacist assumes responsibility for monitoring patient's response to therapy”	4.60 (0.55) (3-5)	22	2 (2.08%)	4.51 (0.55) (3-5)	15	0	4.68 (0.54) (3-5)	7	2 (3.77%)
Question 13: “This pharmacist verbally communicates	4.64 (0.50) (3-5)	30	6 (5.21%)	4.55 (0.50) (4-5)	18	3 (6.98%)	4.71 (0.50) (3-5)	12	3 (5.66%)

their recommendations to both patients and colleagues in a clear and concise manner”									
Question 14: “This pharmacist’s written documentation facilitates collaboration and continuity of care (accurate, concise, and timely)”	4.62 (0.57) (2-5)	19	5 (5.21%)	4.54 (0.50) (4-5)	13	2 (4.65%)	4.70 (0.61) (2-5)	6	3 (5.66%)

Question 15: “This pharmacist establishes and maintains positive relationships with others to support collaborative care”	4.65 (0.58) (2-5)	31	0	4.63 (0.48) (4-5)	21	0	4.67 (0.65) (2-5)	10	0
Question 16: “This pharmacist effectively manages conflict within the team”	4.34 (0.58) (2-5)	25	16 (16.67%)	4.22 (0.66) (3-5)	13	8 (18.60%)	4.42 (0.69) (2-5)	12	8 (15.09%)
Question 17: “This	4.32 (0.64)	23	5 (5.21%)	4.11 (0.58)	14	4 (9.30%)	4.47 (0.64)	9	1 (1.88%)

pharmacist appears to manage their stress effectively in the workplace”	(2-5)			(3-5)			(2-5)		
Question 18: “OVERALL, how confident are you with this pharmacist’s medication and medication-use expertise?”*	4.84 (0.39) (3-5)	35	0	4.72 (0.51) (3-5)	22	0	4.94 (0.23) (4-5)	13	0
Rater scores by NAPRA competency, mean, range									
Providing care: Clinical care	4.73 (0.48) (2-5)	92	6 (1.54%)	4.64 (0.49) (3-5)	61	2 (1.16%)	4.79 (0.47) (2-5)	31	4 (1.85%)

Professionalism	4.64 (0.54) (1-5)	171	24 (1.95%)	4.54 (0.54) (2-5)	100	14 (4.07%)	4.71 (0.54) (1-5)	71	10 (2.32%)
Communication and collaboration	4.57 (0.58) (2-5)	143	48 (9.90%)	4.49 (0.54) (2-5)	85	23 (10.70%)	4.63 (0.60) (2-5)	58	25 (9.26%)

Overall, raters rated ratees very positively on all questions with 16/18 questions (88.8%) rated above a mean of 4.5. Only questions 16 and 17 had ratings below a mean of 4.5 (4.34 and 4.32 respectively) which were questions centered on conflict and stress in the workplace respectively. Between peers and non-peers, non-peers rated ratees higher on every question except for question 1 and question 8. The highest NAPRA competency rating was providing care: clinical care with a mean rating of 4.73 (range = 2-5, SD=0.48), while the lowest NAPRA competency rating was communication and collaboration with a mean rating of 4.57 (range = 2- 5, SD = 0.58). In the middle was the NAPRA competency of professionalism with a mean rating of 4.64 (Range = 1-5, SD = 0.54). Although question 5 was not mapped to one of the three competencies of interest, it had the highest number of total narrative comments to support ratings (42 comments); question 7 received the fewest (16 comments).

Only one question (question 2) (1/18, 5.5%) had above a 20% 'unable to assess' rate. Question 2 had an 'unable to assess' rate of 21.88% which was a composite of 23.25% of peers and 20.75% of non-peer being 'unable to assess'. Only two other questions (questions 3 and 16) had an 'unable to assess' rate of greater than 15% but less than 20%. All three NAPRA competencies had an overall low percentage of 'unable to assess', however, the competency of communication and collaboration had an overall 'unable to assess' rate of 9.9% compared to 2.19% in professionalism and 1.54% in providing care: clinical care.

The mean amount of time it took to complete the MSF questionnaire for all raters was 12.2 minutes (range = 2 - 40, SD = 8.84). For peer raters, the mean time to complete was 14.5 minutes (range = 2- 40, SD = 9.67), whereas for non-peers it was 10.3 minutes (range = 2 - 40, SD = 7.55).

The Cronbach's alpha for non-peer and peer rating items were 0.87 and 0.89, respectively. As both Cronbach's alphas were greater than 0.70, the internal reliability of the MSF questionnaire was found to be acceptable for both peer and non-peer raters.

5.4 Facilitated Discussion

The general reaction from all ratees to their MSF was positive and affirming. Four out of nine ratees had expected the feedback to be more critical of their practice. Additionally, four out of nine ratees noted that their self-assessment scores were lower than scores from

their peer and non-peer raters and they commented that this could be a sign of imposter syndrome and lack of

confidence. One ratee did note some dissonance with ratings (their self-assessment score was significantly higher than one rating from a rater) but was interested in self-reflecting and exploring this difference. Only one ratee disagreed with a narrative feedback comment from a rater and did not incorporate it into their action plans. Eight of nine ratees were able to create at least one action plan and eight of nine ratees created an action plan targeting their lowest scoring competency. Ratees created an average of one to two action plans (mean =1.78), with one ratee creating three action plans, and one ratee creating no action plans. Sixty-nine percent (11/16) of action plans contained at least one component of a SMART goal. Barriers ratees experienced in enabling their action plans included:

1. High patient complexity and high pharmacist-to-patient ratios: four out of nine ratees
2. Awareness of available resources: two out of nine ratees
3. Staffing issues: one out of nine ratees
4. Lack of appropriate workspace: one out of nine ratees
5. Motivation: one out of nine ratees.

Three out of nine of ratees commented on having no barriers to enacting their action plans.

5.5 Post MSF-process survey for raters

The results of the post MSF-process survey for raters are located in Table 5.5.

Table 5.5: Post-MSF process survey for raters responses

Likert scale:1 (strongly disagree) 2 (disagree) 3 (Neither agree nor disagree - neutral response) 4 (agree) 5 (strongly agree)

Post MSF-process survey for raters (peer and non-peer) (N=94)				
		(Peer) N=40*	(Non-peer) N=54	
Post MSF- process survey question	Frequency and Total mean score (SD) (range)	Frequency and Peer total mean score (SD) (range)	Frequency and non-peer total mean score (SD) (range)	T-test for independent Means
1. Please rate how useful this multi-source feedback is in assessing professionalism for your pharmacist colleague	Frequency: 5: 13 4: 51 3: 26 2: 2 1: 2 Mean:3.75 (0.79) (1-5)	Frequency: 5: 1 4: 22 3: 13 2: 2 1: 2 Mean: 3.45 (0.84) (1-5)	Frequency: 5: 12 4: 29 3: 13 2: 0 1: 0 Mean: 3.98 (0.68) (3-5)	t=-3.360, P = <0.001

<p>2. Please rate how useful this multi-source feedback is in assessing collaboration for your pharmacist colleague</p>	<p>Frequency: 5: 13 4: 51 3: 23 2: 6 1: 2 Mean: 3.70 (0.86) (1-5)</p>	<p>Frequency: 5: 2 4: 21 3: 11 2: 4 1: 2 Mean: 3.43 (0.92) (1-5)</p>	<p>Frequency: 5: 11 4: 29 3: 12 2: 2 1: 0 Mean: 3.91 (0.75) (2-5)</p>	<p>t=-2.766, P = 0.007</p>
<p>3. Please rate how useful this multi-source feedback is in assessing communication for your pharmacist colleague</p>	<p>Frequency: 5: 15 4: 52 3: 18 2: 7 1: 2 Mean: 3.75 (0.88) (1-5)</p>	<p>Frequency: 5: 3 4: 22 3: 8 2: 5 1: 2 Mean: 3.48 (0.97) (1-5)</p>	<p>Frequency: 5: 12 4: 30 3: 10 2: 2 1: 0 Mean: 3.96 (0.744) (2-5)</p>	<p>t=-2.723, P = 0.008</p>

<p>4. The amount of time I spent completing the MSF process was considered burdensome</p>	<p>Frequency: 5: 2 4: 11 3: 20 2: 46 1: 15 Mean: 2.35 (0.95) (1-5)</p>	<p>Frequency: 5: 1 4: 6 3: 12 2: 20 1: 1 Mean: 2.65 (0.85) (1-5)</p>	<p>Frequency: 5: 1 4: 5 3: 8 2: 26 1: 14 Mean: 2.12 (0.96) (1-5)</p>	<p>t=2.689, P = 0.009</p>
<p>5. The MSF process was clear and easy to complete</p>	<p>Frequency: 5: 41 4: 45 3: 6 2: 2 1: 0 Mean: 4.33 (0.69) (2-5)</p>	<p>Frequency: 5: 12 4: 24 3: 3 2: 1 1: 0 Mean: 4.18 (0.67) (2-5)</p>	<p>Frequency: 5: 29 4: 21 3: 3 2: 1 1: 0 Mean: 4.44 (0.68) (2-5)</p>	<p>t=-1.887, P = 0.062</p>

6. The process used to recruit me as a rater was simple and easy	Frequency: 5: 41 4: 44 3: 8 2: 1 1: 0 Mean: 4.33 (0.68) (2-5)	Frequency: 5: 12 4: 24 3: 3 2: 1 1: 0 Mean: 4.18 (0.67) (2-5)	Frequency: 5: 29 4: 18 3: 5 2: 0 1: 0 Mean: 4.46 (0.66) (3-5)	$t=-2.026$, P = 0.046
7. The number of questions in the MSF questionnaire was appropriate	Frequency: 5: 22 4: 54 3: 14 2: 4 1: 0 Mean: 4.0 (0.74) (2-5)	Frequency: 5: 6 4: 24 3: 6 2: 4 1: 0 Mean: 3.80 (0.81) (2-5)	Frequency: 5: 16 4: 30 3: 8 2: 0 1: 0 Mean: 4.15 (0.65) (3-5)	$t=-2.282$, P = 0.025
8. I would recommend the completion of	Frequency: 5: 16 4: 34	Frequency: 5: 3 4: 12	Frequency: 5: 13 4: 22	$t=-3.450$, P = <0.001

the MSF process to a pharmacist colleague	3: 34 2: 9 1: 1 Mean: 3.57 (0.91) (1-5)	3: 17 2: 7 1: 1 Mean: 3.25 (0.91) (1-5)	3: 17 2: 2 1: 0 Mean: 3.85 (0.83) (2-5)	
9. I would be willing to repeat the MSF process every five years for my pharmacist colleague	Frequency: 5: 22 4: 49 3: 12 2: 9 1: 2 Mean: 3.85 (0.95) (1-5)	Frequency: 5: 4 4: 23 3: 5 2: 6 1: 2 Mean: 3.53 (1.02) (1-5)	Frequency: 5: 18 4: 26 3: 7 2: 3 1: 0 Mean: 4.09 (0.82) (2-5)	t=-2.945, P = 0.004

<p>10. I believe the MSF questionnaire is an important activity for the development of my pharmacist colleagues' communication, collaboration, and professionalism.</p>	<p>Frequency: 5: 16 4: 36 3: 29 2: 10 1: 3 Mean: 3.56 (0.98) (1-5)</p>	<p>Frequency: 5: 3 4: 17 3: 11 2: 6 1: 3 Mean: 3.28 (1.05) (1-5)</p>	<p>Frequency: 5: 13 4: 19 3: 18 2: 4 1: 0 Mean: 3.76 (0.90) (2-5)</p>	<p>t=-2.376, P = 0.020</p>
<p>11. I expect the professional performance of my pharmacist colleague to improve as a result of the MSF process</p>	<p>Frequency: 5: 7 4: 24 3: 48 2: 11 1: 3 Mean: 3.22 (0.87) (1-5)</p>	<p>Frequency: 5: 1 4: 6 3: 23 2: 6 1: 3 Mean: 2.90 (0.84) (1-5)</p>	<p>Frequency: 5: 6 4: 18 3: 25 2: 5 1: 0 Mean: 3.46 (0.81) (2-5)</p>	<p>t=-3.234, P = 0.002</p>

*Three peer raters had previously rated rates and completed the Post-MSF survey only once.

Ninety-four (40 peer and 54 non-peer) raters completed the post MSF-process survey. The peer group contained three fewer raters as they had previously rated other ratees and thus did not complete the post MSF-process survey multiple times. The questions with the most agreement by both peer and non-peer raters were “The MSF process was clear and easy to complete” (91.4% of raters agree or strongly agree) and “The process used to recruit me as a rater was simple and easy” (90.4% agree or strongly agree). These results combined with the overall positive response for “the number of questions in the MSF questionnaire was appropriate” (80% of raters agree or strongly agree) indicate a high level of agreement with the acceptability and feasibility of the MSF process.

The two questions with the lowest agreement by both peer and non-peer raters were “I believe the MSF questionnaire is an important activity for the development of my pharmacist colleagues' communication, collaboration, and professionalism.” (55% agree or strongly agree) and “I expect the professional performance of my pharmacist colleague to improve as a result of the MSF process” (33% agree or strongly, agree, 51% neither agree or disagree, and 15% disagree or strongly disagree). One rater expressed skepticism about the process, stating, “I do not believe it accurately captures competencies for pharmacists.” Question 4 “The amount of time I spent completing the MSF process was considered burdensome” (64.9% disagree or strongly disagree) indicates the process was not particularly burdensome with respect to time. However, peer raters did find it more burdensome than non-peers (52.5% of peers disagree or strongly disagree compared to 74% non-peers)

The three questions surrounding how useful this MSF process is in assessing ratee professionalism/communication/collaboration from the perspective of the rater showed slight agreement. However, a statistically significant difference emerged between peer and non-peer raters. Peers were less confident in the usefulness of the MSF process in evaluating these competencies. For professionalism, 58% of peers agreed or strongly agreed, compared to 76% of non-peers, with the difference being statistically significant ($t = -3.36, p < 0.001$). Similarly, for collaboration, 58% peers agreed or strongly agreed compared to 74% of non-peers, which was also significant ($t = -2.77, p = 0.007$). The same trend was observed for communication, where 63% peers agreed or strongly agreed compared to 78% of non-peers, again showing a significant difference ($t = -2.72, p =$

0.008). The question “I would recommend the completion of the MSF process to a pharmacist colleague” (53.2% of raters agree or strongly agree) also scored lower compared to other questions in the post-MSF process survey with peers being less likely to recommend the MSF process than non-peers (37.5% of peers agree or strongly agree compared to 64.8% non-peers).

All open-ended responses to the post MSF-survey are located in **Appendix L**. A structured tabular thematic analysis was completed on two questions in the post-MSF process survey for raters (Table 5.6).

Table 5.6: Post-MSF process survey for raters structured tabular thematic analysis of open-ended responses

Post MSF-process survey structured tabular thematic analysis of open-ended responses				
	themes = number of open ended responses (% of total, excluding not-applicable responses)			
Question	Positive	Negative	Suggestion for improvement	Not applicable
Why would you recommend or not recommend the MSF process (peers)	11 (39.28%)	15 (53.57%)	2 (7.15%)	2
Why would you recommend or not recommend the MSF process (non-peers)	24 (82.75%)	4 (13.80%)	1 (3.45%)	5
Why would you recommend or not recommend the MSF process (total)	35 (61.41%)	19 (33.33%)	3 (5.26%)	7

Do you have any additional comments on this MSF process? (peer)	1 (7.15%)	9 (64.28%)	4 (28.57%)	1
Do you have any additional comments on this MSF process? (non-peer)	2 (28.57%)	2 (28.57%)	3 (42.86%)	5
Do you have any additional comments on this MSF process? (total)	3 (14.29%)	11 (52.38%)	7 (33.33%)	6

There were ninety-one (n=91) responses over the two questions with sixty-four (n=64) responses for “why would you recommend or not recommend the MSF process” and twenty- seven (n=27) responses for “do you have any additional comments on this MSF process”. Inter- analyst agreement of the thematic analysis for both questions was 95.61% (87/91). For the question “why would you recommend or not recommend the MSF process” the intra-analyst agreement was 98.43% (63/64), and for the question “do you have any additional comments on this MSF process” the intra-analyst agreement was 96.30% (26/27).

The peer rater responses for “why would you recommend or not recommend the MSF process” were relatively negative (n=15, 53.57%) compared to positive (n=11 39.28%), whereas the non-peer responses were mostly positive (n=24, 82.75%). One peer rater expressed a key concern, stating, “I would not recommend it as the MSF process is at risk for cherry-picking colleagues with the best relationship with the raters. When both peer and non-peer responses are combined the overall results are positive (n=35, 61.41%) compared to negative (n=19, 33.33%) with one rater commenting “I think it would be very informative to experience getting feedback from the MSF process. I would like to know what others see as my personal strengths and weaknesses, and so I assume my professional colleagues likely feel similarly and would also benefit from the feedback received”. There were seven (10.93%) responses that were not applicable or unable to be categorized into themes. This was driven by non-peer responses (n=5). Only three of the responses were themed as

suggestions for improvement (5.26%).

For the question “do you have any additional comments on this MSF process” the overall percentage of negatively themed responses was 52.38% compared to a positive theming of 14.29%. The majority of negative responses came from peers (n=9) compared to non-peers (n=2). One peer rater commented, “I think that to implement the MSF process for licensure would likely cost a lot, with little gain at assessing competency.” Another expressed apprehension about the potential consequences of poor ratings, stating, “I feel like this is a recipe for conflict in departments if anyone is rated poorly.” However, this question had more responses for the theme suggestions for improvement (n=7, 33.33%) when compared to the other question with one suggestion being “Need a question about educational role performed by Pharmacist (related to teaching pharmacy learners or other healthcare professionals)”. The number of responses that were themed as not applicable was also higher in this question (e.g. “It is also hard for pharmacists to be at their best when the resources are not there when we are short staffed.” or “This post process survey is VERY long.”) (n=6) which was largely driven by non-peers (n=5).

The results of the OSDS question are located in Table 5.7.

Table 5.7: Post-MSF process survey for raters Osgood semantic differential scale (OSDS)

OSDS: 1 (agree with negative adjective) (7 agree with positive adjective)

Post MSF-process survey for raters: Osgood semantic differential scale (peer and non-peer) (N=94)			
		N=40*	N= 51
Bipolar adjectives	Total mean score (SD)	Peer total mean score (SD)	Non-peer total mean score (SD)
Unfeasible <-> Feasible	Frequency 1: 1 2: 7 3: 3	Frequency 1: 1 2: 6 3: 2	Frequency 1: 0 2: 1 3: 1

	4: 9 5: 18 6: 33 7: 20 Mean: 5.36 (1.48)	4: 4 5: 10 6: 13 7: 4 Mean:4.78 (1.65)	4: 5 5: 8 6: 20 7: 16 Mean:5.8 (1.15)
Unacceptable <-> Acceptable	Frequency 1: 1 2: 0 3: 7 4: 13 5: 17 6: 33 7: 19 Mean: 5.44 (1.28)	Frequency 1: 1 2: 0 3: 4 4: 7 5: 11 6: 14 7: 2 Mean: 4.97 (1.25)	Frequency 1: 0 2: 0 3: 3 4: 6 5: 6 6: 19 7: 17 Mean:5.8 (1.18)
Unfair <-> Fair	Frequency 1: 2 2: 3 3: 6 4: 9 5: 18 6: 34 7: 18 Mean: 5.45 (1.44)	Frequency 1: 2 2: 3 3: 4 4: 5 5: 9 6: 14 7: 2 Mean:4.68 (1.59)	Frequency 1: 0 2: 0 3: 2 4: 4 5: 9 6: 20 7: 16 Mean:5.86 (1.07)
Negative <-> Positive	Frequency 1: 2 2: 2 3: 2 4: 17 5: 15	Frequency 1: 2 2: 2 3: 1 4: 10 5: 9	Frequency 1: 0 2: 0 3: 1 4: 7 5: 6

	6: 32 7: 20 Mean: 5.41 (1.38)	6: 12 7: 3 Mean: 4.79 (1.49)	6: 20 7: 17 Mean: 5.88 (1.08)
Not valid <-> Valid	Frequency 1: 1 2: 4 3: 6 4: 16 5: 17 6: 34 7: 12 Mean: 5.15 (1.38)	Frequency 1: 1 2: 4 3: 2 4: 9 5: 9 6: 13 7: 1 Mean: 4.64 (1.44)	Frequency 1: 0 2: 0 3: 4 4: 7 5: 8 6: 21 7: 11 Mean: 5.49 (1.19)
Unreliable <-> Reliable	Frequency 1: 4 2: 1 3: 10 4: 16 5: 15 6: 34 7: 10 Mean: 4.98 (1.50)	Frequency 1: 3 2: 1 3: 7 4: 9 5: 8 6: 11 7: 0 Mean: 4.31 (1.49)	Frequency 1: 1 2: 0 3: 3 4: 7 5: 7 6: 23 7: 10 Mean: 5.51 (1.29)

*One rater completed only the first adjective: N=39 for the remaining adjectives

Thirty-nine peer raters completed the OSDS question; one peer rater rated only the first bipolar adjective. Fifty-one out of 54 non-peer raters completed the OSDS question. All bipolar adjectives were positively associated with every question with a mean score greater than 4. The overall high rate of agreement was again driven by non-peer raters who rated the adjectives higher than peers on every question. The highest scoring adjectives were unfair/fair (5.45) and unacceptable/acceptable (5.44). The lowest-scoring adjective was

unreliable/reliable (4.98).

When separated by peer and non-peer, the highest scoring adjectives in non-peers were unacceptable/acceptable (5.8), unfair/fair (5.86), and negative/positive (5.88), while the lowest was valid/not valid (5.49). The highest scoring adjective for peers was unacceptable/acceptable (4.97), while the lowest was unreliable/reliable (4.31). Although mean scores on all OSDS questions were high, there were some raters who rated adjectives negatively (a score of 1,2, or 3).

5.6 Post MSF-process survey for ratees

The results of the post MSF-process survey for ratees are located in Table 5.8.

Table 5.8: Post-MSF process survey for ratees responses

Likert scale :1 (strongly disagree) 2 (disagree) 3 (Neither agree nor disagree - neutral response) 4 (agree) 5 (strongly agree)

Post MSF-process survey for ratees (N=9)	
Post MSF-process survey question	Frequency and Total mean score (SD) (range)
1. Please rate how useful this multi-source feedback is in assessing your professionalism	Frequency: 5: 0 4: 8 3: 1 2: 0 1: 0 Mean: 3.89 (0.31) (3-4)
2. Please rate how useful this multi-source feedback is in assessing your ability to collaborate	Frequency: 5: 0 4: 7 3: 1 2: 1 1: 0

	Mean: 3.67 (0.67) (2-4)
3. Please rate how useful this multi-source feedback is in assessing your communication	<p>Frequency:</p> <p>5: 0</p> <p>4: 9</p> <p>3: 0</p> <p>2: 0</p> <p>1: 0</p> <p>Mean: 4 (0) (4)</p>
4. The amount of time I spent completing the MSF process was considered burdensome	<p>Frequency:</p> <p>5: 1</p> <p>4: 4</p> <p>3: 1</p> <p>2: 3</p> <p>1: 0</p> <p>Mean: 3.33 (1.05) (2-5)</p>
5. The MSF process was clear and easy to complete	<p>Frequency:</p> <p>5: 0</p> <p>4: 9</p> <p>3: 0</p> <p>2: 0</p> <p>1: 0</p> <p>Mean: 4 (0) (4)</p>
6. The process used to recruit raters was simple and easy	<p>Frequency:</p> <p>5: 0</p> <p>4: 4</p> <p>3: 2</p> <p>2: 2</p>

	<p>1: 1</p> <p>Mean: 3 (1.05) (1-4)</p>
7.The number of raters (peer and non-peer) to recruit was appropriate	<p>Frequency:</p> <p>5: 0</p> <p>4: 3</p> <p>3: 3</p> <p>2: 2</p> <p>1: 1</p> <p>Mean: 2.89 (0.99) (1-4)</p>
8. The number of questions in the MSF questionnaire was appropriate	<p>Frequency:</p> <p>5: 0</p> <p>4: 5</p> <p>3: 2</p> <p>2: 2</p> <p>1: 0</p> <p>Mean: 3.33 (0.82) (2-4)</p>
9. I would recommend the completion of the MSF process to a pharmacist colleague	<p>Frequency:</p> <p>5: 1</p> <p>4: 6</p> <p>3: 0</p> <p>2: 1</p> <p>1: 1</p> <p>Mean: 3.56 (1.16) (1-5)</p>
10. I would be willing to repeat the MSF process every five years for my pharmacist colleague	<p>Frequency:</p> <p>5: 1</p> <p>4: 6</p> <p>3: 1</p> <p>2: 1</p>

	<p>1: 0</p> <p>Mean: 3.78 (0.78) (2-5)</p>
<p>11. I believe the MSF questionnaire is an important activity for the development of my communication, collaboration, and professionalism.</p>	<p>Frequency:</p> <p>5: 1</p> <p>4: 3</p> <p>3: 3</p> <p>2: 2</p> <p>1: 0</p> <p>Mean: 3.33 (0.94) (2-5)</p>
<p>12. I expect my professional performance to improve as a result of the MSF process</p>	<p>Frequency:</p> <p>5: 1</p> <p>4: 2</p> <p>3: 6</p> <p>2: 0</p> <p>1: 0</p> <p>Mean: 3.44 (0.68) (3-5)</p>
<p>13. The feedback I have received through the MSF process has increased my awareness and ability to self-assess</p>	<p>Frequency:</p> <p>5: 0</p> <p>4: 4</p> <p>3: 4</p> <p>2: 1</p> <p>1: 0</p> <p>Mean: 3.33 (0.67) (2-4)</p>

All nine rates completed the post MSF-process survey. One hundred percent of rates agreed with question 5, “the MSF process was clear and easy to complete”. Rates agreed with the questions “I would recommend the completion of the MSF process to a pharmacist colleague” (77.7% agree or strongly agree) and “I would be willing to repeat the

MSF process every five years for my pharmacist colleague” (77.7% agree or strongly agree). However, ratees were less positive about the amount of time spent completing the MSF process (55.5% agree) and the number of questions in the MSF questionnaire (55.5% agree). Ratees were relatively divergent on “the process used to recruit raters was simple and easy” (44.4% agree, 22.2% neither agree or disagree, 33.4% disagree or strongly disagree). There was little agreement with the statement “the number of raters (peer and non-peer) to recruit was appropriate (33.4% agree, 22.2% neither agree or disagree, 33.4% disagree or strongly disagree), which aligns with the observation that only one ratee achieved the targeted number of raters. Overall, ratees found the MSF process acceptable and feasible, while highlighting concerns related to rater recruitment and time spent completing the process.

Like the raters, the ratees were asked the three questions surrounding how useful this MSF process is in assessing their professionalism/communication/collaboration. Interestingly, scores differed between all three questions with communication ranking the highest (100% of ratees agreed), then professionalism (88.8% of ratees agreed), followed by collaboration (77.7% of ratees agreed).

Ratees were also asked if they “believe the MSF questionnaire is an important activity for the development of my communication, collaboration, and professionalism” (44.4% agree or strongly agree, 33.3% neither agree or disagree, 22.2% disagree), “I expect my professional performance to improve as a result of the MSF process” (33.3% agree or strongly agree, 66.6% neither agree or disagree), and “the feedback I have received through the MSF process has increased my awareness and ability to self-assess” (44.4% agree, 44.4% neither agree or disagree).

All open-ended responses to the post-MSF survey are located in (**Appendix L**). A structured tabular thematic analysis was completed on two questions in the post-MSF process survey for ratees “why would you recommend or not recommend the MSF process?” and “do you have any additional comments on this MSF process?” (Table 5.9).

Table 5.9: Post-MSF process survey for ratees structured tabular thematic analysis of open-ended responses

Post MSF-process survey structured tabular thematic analysis of open-ended responses				
	themes = number of open-ended responses (% of total)			
Question	Positive	Negative	Suggestion for improvement	Not applicable
Why would you recommend or not recommend the MSF process	0	2 (100%)	0	0
Do you have any additional comments on this MSF process?	4 (33.33%)	5 (41.66%)	3 (25%)	0

There were fourteen (n=14) responses over the two questions with two responses for “why would recommend or not recommend the MSF process” and twelve responses for “do you have any additional comments on this MSF process”. The intra-analyst agreement on the themes for the question “why would you recommend or not recommend the MSF process?” was 100% (2/2), while the intra-analyst agreement for the question “do you have any additional comments on this MSF process” was 91.66% (11/12). The only two responses received for “why would you recommend or not recommend the MSF process” were negative. One respondent remarked, “I wouldn’t recommend it currently, as the way the selection process is for your raters seems incredibly biased (close friendships with rater,

choosing raters that you know will say positive things) and may lead to not receiving any actionable feedback.” Another stated, “I would not recommend this process to a colleague because it was time consuming to find enough people to complete the survey. I did not find it helpful on how to facilitate change in my current practice. I also do not understand how a subjective rating scale such as a survey is supposed to measure an objective outcome such as competency as a pharmacist, as such this can be influenced both positively and negatively by the way raters complete their questionnaire.” For the question “do you have any additional comments on this MSF process” the responses were distributed between positive (n=4, 33.33%), negative (n=5, 41.66%), and suggestions for improvement (n=3, 25%). One participant noted a positive aspect, stating, “Overall, I found this to be a helpful way to see how your interprofessional team/colleagues view you as a pharmacist. I found the comments to be the most valuable when reviewing my results, but do think the number of questions and associated comments within the survey limited meaningful responses by the raters.” Another respondent raised a concern, saying, “It was easy to identify the responses in the report. One idea is to have a bar graph with the highest and lowest number and an average so you cannot distinguish who completed what. I think it has the potential to cause conflict with coworkers if someone isn’t meeting standards and is unaware of it. I know from personal experience it would be difficult to honestly rate a coworker when the study size is so small.” These responses reflect a mix of appreciation for the process, concerns about confidentiality and potential conflict, and suggestions for enhancing the design and functionality of the MSF process.

The results of the OSDS question are located in Table 5.10.

Table 5.10: Post-MSF process survey for ratees Osgood semantic differential scale (OSDS)
OSDS range: 1 (agree with negative adjective) (7 agree with positive adjective)

Post MSF-process survey for ratees: Osgood semantic differential scale (N=9)	
Bipolar adjective	Frequency and Mean score (SD)
Unfeasible <-> Feasible	Frequency: 1: 0 2: 1 3: 2

	<p>4: 0</p> <p>5: 3</p> <p>6: 3</p> <p>7: 0</p> <p>4.55 (1.42)</p>
*Unacceptable <-> Acceptable	<p>Frequency:</p> <p>1: 0</p> <p>2: 1</p> <p>3: 0</p> <p>4: 1</p> <p>5: 2</p> <p>6: 4</p> <p>7: 0</p> <p>5 (1.32)</p>
Unfair <-> Fair	<p>Frequency:</p> <p>1: 1</p> <p>2: 0</p> <p>3: 0</p> <p>4: 0</p> <p>5: 4</p> <p>6: 3</p> <p>7: 1</p> <p>5.11 (1.59)</p>

Negative <-> Positive	<p>Frequency:</p> <p>1: 1</p> <p>2: 0</p> <p>3: 0</p> <p>4: 1</p> <p>5: 3</p> <p>6: 4</p> <p>7: 0</p> <p>4 (1.15)</p>
Not valid <-> Valid	<p>Frequency:</p> <p>1: 1</p> <p>2: 0</p> <p>3: 0</p> <p>4: 4</p> <p>5: 1</p> <p>6: 3</p> <p>7: 0</p> <p>4.44 (1.50)</p>
Unreliable <-> Reliable	<p>Frequency:</p> <p>1: 0</p> <p>2: 1</p> <p>3: 0</p> <p>4: 5</p> <p>5: 1</p> <p>6: 2</p> <p>7: 0</p> <p>4.33 (1.15)</p>

*N=8, one participant skipped this question

All nine ratees completed the OSDS question, with one ratee not rating the bipolar adjective

of unacceptable/acceptable. All bipolar adjectives were positively associated with every question having a mean score greater than 4. The highest scoring adjectives were unfair/fair (5.11) and unacceptable/acceptable (5) which is similar to that of peer/non-peer raters. The lowest scoring adjective was negative/positive with a mean of 4. Although the mean scores on all OSDS questions were high, three ratees provided low scores (1, 2, or 3) specifically when evaluating the feasibility of the MSF process. In contrast, all other bipolar adjective pairs had only one ratee assigning a low score.

Chapter 6 Discussion

This pilot study of MSF in hospital/healthcare-system pharmacists in Saskatchewan adds a critical perspective to the growing body of literature, being the first study of MSF in hospital/healthcare-system pharmacists in Canada, addressing both the potential and the challenges of implementing MSF as a tool for assessing competencies and enhancing professional development in pharmacy practice. Positioned within the broader framework of pharmacy competency and CPD, this study provides valuable insights into the validity and reliability of MSF, emphasizing its role in assessing key competencies such as communication, collaboration, and professionalism—critical areas identified by NAPRA competencies (NAPRA, 2024) and other healthcare professions (Bonds, 2018; Desmedt et al., 2021; John et al., 2020; Lockyer & Sargeant, 2022).

This study contributes to the literature by addressing a gap in MSF research specific to Canadian hospital/healthcare-system pharmacy, providing evidence that with refinements informed by the pilot study, MSF could serve as an effective tool for professional development in this field. Expanding MSF to include a broader range of raters like patients, enhancing recruitment strategies, enhancing coaching and facilitation components, and examining MSF's effects on practice change could significantly improve its effectiveness as a tool for fostering professional development and competency in hospital/healthcare-system pharmacy practice.

6.1 Validity and reliability

6.1.1 Content validity

Initial validation efforts included feedback from a pre-pilot focus group, the advisory committee, and a thorough review of relevant literature. Content validity was only assessed with Saskatchewan hospital pharmacist experts and the focus group. Nevertheless, the content of the MSF questionnaire was guided by NAPRA competencies, which are mandatory and relevant to all hospital pharmacists in Canada. Expanding content validation

to include experts and participants from other provinces and countries would be beneficial, as variations in practice environments and professional standards may influence the relevance and applicability of questions used for MSF surveys. Feedback from both ratees and raters indicated a perceived validity of the MSF process, as evidenced by responses in the post-MSF survey using the OSDS. Additionally, formal content validation was not conducted for non-pharmacist participants, with the exception of inclusion of a pharmacy technician in the pre-pilot focus group, which could affect the generalizability of the findings.

6.1.2 Construct validity

When analyzing the three questions surrounding how useful this MSF process is in assessing professionalism/communication/collaboration for the ratee from the perspective of the rater, a statistically significant difference emerged between peer and non-peer raters. Peer raters were less confident in the usefulness of the MSF process in evaluating these competencies. Lower ratings on these questions could suggest that peer raters do not believe the MSF process effectively measures professionalism/communication/collaboration, indicating a potential issue with the construct validity of the MSF tool in assessing these specific competencies. Ratees were asked the same questions and indicated an overall high confidence in assessing those competencies. This suggests that ratees hold favorable views regarding the utility of the MSF process in assessing those competencies which is important for establishing construct validity.

Mean scores for all questions were very high and negatively skewed on the self-assessment, peer, and non-peer MSF assessments. This pattern aligns with findings from previous MSF studies (Archer et al., 2008; Lockyer et al., 2006; Violato et al., 2009; Violato et al., 2003; Wright et al., 2012) as well as studies specific to pharmacists (Patel et al., 2009, 2011; Davies et al., 2013). However, it is important to acknowledge that the small sample size of this pilot study, with only nine ratees, limits the generalizability of these findings and limits the ability to draw definitive conclusions about construct validity. While comparisons to the literature provide context, the limited number of participants may not fully capture the variability present in larger studies or real world application. The high self-assessment scores may reflect ratees' tendency to perceive themselves as above average, overestimate

the ease with which they complete tasks, and exhibit overconfidence in judgment, consistent with well-documented biases in self-assessment (Dunning et al., 2004; Eva & Regehr, 2008). The high rater scores may partially be due to preferential selection of raters by ratees, in that ratees may have selected raters who they suspected would give them positive assessments. For instance, Archer and McAvoy (2011) found that 50% of assigned peer raters gave scores of “less than satisfactory” to physicians who were previously identified as performing poorly. This percentage decreased to 19% when ratees were allowed to self-select raters.

The high self-assessment scores observed in this study may also reflect characteristics of the pharmacist ratees. Many participants had additional post graduate pharmacy residency training, and by virtue of volunteering for this study, they demonstrated a strong interest in professional development. Such characteristics could contribute to the positive self-assessments and the favorable views of the MSF process among ratees, suggesting that the sample may represent a group of pharmacists who are already well-equipped and motivated to engage in reflective practices and ongoing improvement.

To address the concern of potential selection bias in MSF, it is important to acknowledge the trade-offs between methodological rigor and practical considerations. This study allowed the self-selection of raters based on both the acceptability and feasibility of the process, as well as the logistical constraints associated with real-world application. From an acceptability perspective, giving participants control over selecting their raters can enhance engagement and reduce the burden of the feedback process, thereby increasing compliance and overall participation rates. Feasibility was also a key factor, as the process needed to be manageable within the confines of this pilot study and applicable in future regulatory processes. Regulatory bodies that oversee professional development and assessment may adopt MSF processes in ways that accommodate self-selection, making this an essential consideration in the design of this study. While self-selection may introduce some degree of bias, it reflects a pragmatic approach that balances the need for reliable data with the operational realities of implementing MSF.

Other factors such as the halo effect, perceived negative consequences of providing low ratings, and doubts about confidentiality might have contributed to the high scores observed (Williams et al., 2003). The halo effect, where individual performance items are

influenced by the rater's overall impression, is particularly persistent despite rater training (Sherbino & Norman, 2017; Silber et al., 2004). This cognitive bias can significantly impact the accuracy of performance assessments, making it crucial to develop strategies to mitigate its effects. Potential approaches could include increasing the number of raters, implementing detailed rubrics for competency assessments, and combining MSF with other evaluation methods. These strategies not only address the halo effect but also help reduce construct-irrelevant variance—the degree to which test scores are affected by factors extraneous to the intended construct (American Educational Research Association, 2014). Construct-irrelevant variance poses a threat to the validity of the MSF process and should be minimized wherever possible (Palermo, 2022).

To further enhance the objectivity and reliability of the MSF process, rater training programs and the development of 'assessor readiness' programs could be beneficial (Tavares et al., 2023). Rater training typically involves educating assessors on how to apply rating criteria consistently, recognize their own potential biases, and provide constructive feedback. However, the feasibility of implementing such training programs warrants careful consideration. One of the primary challenges is whether raters, particularly in a busy clinical setting, would have the time and capacity to participate in these programs. Time constraints are a common concern in healthcare environments, and requiring raters to undergo additional training might affect their willingness to participate, potentially impacting recruitment and overall engagement with the MSF process (Richmond et al., 2011). Therefore, if rater training is implemented, it is crucial to design it in a way that is concise, accessible, and time-efficient, perhaps incorporating online modules or brief, focused sessions. From an acceptability perspective, the addition of a structured rater training component could improve the perceived fairness and transparency of the MSF process among participants, both raters and ratees. By ensuring that all raters are prepared to assess their colleagues in a consistent and unbiased manner, the credibility of the feedback provided would likely increase, which could enhance the overall acceptance of MSF as a valid assessment tool (Ashworth et al., 2021).

For organizations looking to implement MSF, the introduction of rater training would likely improve the robustness of the assessment data collected. However, they would need to weigh the costs and logistics of mandating such training programs. For regulatory

bodies, integrating rater training into mandatory CPD requirements could be one way to align these initiatives with existing regulatory frameworks, thereby minimizing additional burdens on practitioners. Rater training could include information on the evidence supporting MSF, guidance on using rubrics to consistently rate ratees, and the importance of providing narrative comments to justify ratings. This training could be delivered through various formats, such as workshops, remote learning opportunities, or self-directed learning modules, allowing for flexibility based on the needs of the organization and its practitioners. However, mandatory training could only be enforced for professions under the jurisdiction of regulatory bodies. For example, SCPP could mandate mandatory rater training for pharmacists and pharmacy technicians, but not other professions like nurses or physicians.

Adjusting ratings to control for leniency could be another method to address the negative skew observed in the current study (Seaward et al., 2023). One approach is to apply statistical techniques such as linear mixed modeling, which accounts for individual rater tendencies and can help disentangle leniency bias from true performance assessments (Roberts et al., 2010). Additionally, a more straightforward technique, such as adjusting scores based on the mean and standard deviation of ratings, could offer a more practical alternative for correcting leniency (Seaward et al., 2023). However, adjusting ratings to control for leniency could make rater recruitment more challenging by raising concerns about the transparency and fairness of the MSF process. Raters may feel that their judgments are being overridden, leading to perceptions of diminished autonomy and increased pressure to rate lower. Additionally, the perceived complexity and potential ethical concerns associated with rating adjustments might discourage participation, as ratees and raters may be reluctant to engage in a process they perceive as less straightforward or potentially biased.

6.1.3. Response process validity

Only one statement in this study had an “unable to assess” rate of 20% or higher which is the threshold established in previous studies for revision or deletion. (Lockyer, 2003a; Violato et al., 2003) This suggests the questionnaire was well-constructed and that the competencies included were assessable by the raters

The “unable to assess” responses could be attributed to a genuine lack of opportunities for raters to observe relevant behaviours. Responses, such as the two quotes below from peer raters, indicates this could be accurate in some cases. “My pharmacy colleagues are very independent and I don't observe their interactions with other people. Also, Participant is a new pharmacist and I don't have enough interaction with her to add constructive feedback“ and “it is challenging in a busy, sometimes short staffed environment to fully observe some of the activities for valuable feedback/being able to provide direct examples as cannot follow the pharmacist to complete a lot of activities”. Saskatchewan’s large number of small rural hospitals is also unique where there may be a limited number of pharmacists and therefore reduced opportunities to observe peers. In contrast, non-peer raters, such as nurses and physicians, often interact more frequently with pharmacists due to the collaborative nature of small teams, providing them with ample opportunities to observe and evaluate pharmacist behaviours. Consequently, while small hospitals may struggle to recruit an adequate number of peer raters, they may often have a sufficient pool of non-peer raters. Nonetheless, in this study, such a rural bias was not observed, as both rural pharmacists managed to meet the minimum required number of raters and some urban pharmacists struggled to find an adequate number of peers. However, the small sample size in this study limits the ability to draw definitive conclusions.

An alternative explanation for high “unable to assess” rates might be response bias. Mazor et al. (2007) found that in the context of an MSF tool used with medical students and residents, raters were more likely to leave questions unanswered or select 'unable to assess' for residents with lower overall scores, suggesting that missing responses were linked to performance rather than occurring at random. Rater biases may influence the assessment of specific behaviours, with raters more inclined to provide feedback when their perception of the pharmacist is positive and more likely to abstain from responding when their view is less favorable. However, the overall “unable to assess” rates in this study were low and it is unlikely response bias was a factor.

6.1.4 Relationship to external variables

This aspect of validity was not explored in the current study, as it was beyond the scope and logistical feasibility of the research. Incorporating additional methods, such as

OSCEs or Mini-Clinical Evaluation Exercises, would have required extensive resources and coordination, which were not within the study's design parameters. Future implementations of MSF could consider integrating these complementary assessment tools to provide a more comprehensive evaluation of competence and further validate the MSF process.

6.1.5 Consequential validity

Consequential validity refers to the extent to which the MSF process influences the behaviours and professional practices of the ratees. Understanding whether MSF leads to actual improvements in practice is essential for justifying its use and for refining its implementation. However, due to the constraints of this study, a comprehensive evaluation of consequential validity was not feasible. We instead relied on informal feedback from raters and ratees to gauge perceptions of the MSF's potential to influence behaviour.

In the post-MSF process survey, ratees expressed a relatively neutral view on whether the MSF process would result in significant improvements in key competencies or foster self-awareness. However, some responses suggested that ratees value the feedback process, indicating that MSF may encourage self-reflection and professional growth. These responses provide some insights into MSF's potential to foster positive behavioural change.

Raters generally indicated a belief in MSF's value for enhancing professional competencies among ratees with one commenting, "Always good to get feedback from colleagues on how you are doing. There is always room to grow in the profession, and maybe this is the boost or kick in the pants an individual needs to gain future success and fulfillment with their job." However, a notable trend among peer raters suggested skepticism about MSF's ability to improve professional performance, with one rater expressing, "I would like to learn more about the outcomes/see the outcomes before I recommend anything." This skepticism may stem from peer raters close working relationship with ratees, which could provide them with a more critical or realistic perspective on behaviour change. Peer raters' reservations may also reflect their own personal doubts about the impact of MSF on their own behaviours, which could influence their view of its effectiveness in behaviour change among colleagues.

However, relying solely on informal feedback to evaluate consequential validity introduces several limitations, including potential biases such as social desirability or confirmation biases, where participants might report expected or socially acceptable responses (Althubaiti, 2016). Additionally, the informal nature of the feedback lacks the rigor of structured longitudinal assessments that could provide more reliable measures of behavioural change over time. To assess the consequential validity of MSF in pharmacists more accurately, future research should adopt a longitudinal design, tracking changes in professional behaviours over extended periods following MSF interventions.

Given the skepticism observed among peer raters, enhancing the training for peer raters about the goals and expected outcomes of MSF could be beneficial. Educating raters about the evidence supporting MSF and providing clear guidelines on how to provide constructive and actionable feedback may help align rater expectations with the intended goals of the MSF process (Ferguson et al., 2014). Educating raters on how beneficial narrative feedback could be crucial to enhancing consequential validity, as narrative feedback offers specific actionable insights that promote meaningful behaviour change in the ratees is important. Further actions to increase consequential validity could include the addition of patients to the MSF process and strengthening wording of MSF statements (Sargeant, 2006).

6.1.6 External validity

One of the most significant limitations affecting the external validity and generalizability of the findings in this study is the low response rate, which remained at 2.5% of practicing hospital pharmacists in Saskatchewan despite concerted efforts to increase participation. This is much lower than representation in previous MSF studies of nurses (Crossley, 2015) and physicians (Ferguson et al., 2014). However, accurately capturing the true denominator of eligible pharmacists was challenging because the inclusion criteria were self-determined by the participants. Pharmacists assessed their own eligibility based on criteria, such as providing direct patient care for at least 20% of their allocated work time and practicing in a hospital, ambulatory, or primary care environment. While pharmacists practicing in ambulatory or primary care environments were included, those not employed by the SHA likely did not receive the invitation to participate due to the recruitment process.

This limitation makes it difficult to ascertain the total number of eligible pharmacists, further complicating the interpretation of the response rate.

Future research could also explore the potential application of this MSF process for pharmacists working in other settings, such as community pharmacy, long-term care, or non-patient care roles like management. As long as the MSF questions remain rooted in NAPRA competencies, which encompass universal aspects of pharmacy practice such as communication, collaboration, and professionalism, the tool could provide valuable insights for pharmacists practicing in diverse environments. To ensure the tool's effectiveness, the questions would need to be modified to reflect the specific context in which pharmacists work and assess competencies that can be observed and rated reliably. A potential approach could involve including a core set of universal competencies, such as communication and collaboration, applicable to all pharmacists across all settings. Additionally, role-specific questions could be added to assess contextually relevant competencies, such as managerial skills for pharmacy managers or distribution skills for dispensary/drug distribution roles. Expanding the scope of MSF in this manner would enhance its utility as a comprehensive tool for professional development and competency assessment across the pharmacy profession. This adaptation would also contribute to broader applicability and generalizability of MSF findings, ensure consistent assessment rooted in professional standards while accounting for the unique demands of various practice settings.

Sampling bias may also be a notable threat to the external validity of this study. Such biases indicate that certain pharmacists might receive unfairly high or low scores, which reflect sampling bias rather than true differences in professional performance. The voluntary nature of participant response in this study could exacerbate this issue, as those who chose to participate might not be representative of the broader pharmacist population, potentially leading to further skewed results. Individuals who opt to participate in a study often differ systematically from those who do not (Popovic & Huecker, 2023). For example, participants might be more motivated, more engaged in their professional development, or more confident in their performance compared to non-participants. Given the low number of participants, it is challenging to fully ascertain and control for these potential biases.

Further compounding this challenge, systemic biases may also influence the MSF process. Campbell et al. (2011) identified systemic biases in the MSF evaluations of

physicians by colleagues and patients, noting that ratings could be skewed by as much as 20% due to the characteristics of the assessors, such as ethnicity, and characteristics of the physicians being assessed such as their area of practice. These systemic biases, combined with the sampling bias inherent in the study's voluntary design, highlight the need for caution when interpreting the results and the importance of addressing these limitations in future research.

A notable limitation of the current study is that it did not capture key demographic variables such as sex, gender, or ethnicity for either the ratees or raters. The absence of this data prevents an exploration of potential biases related to these characteristics and limits the ability to contextualize the findings in relation to systemic factors that may influence MSF ratings. Future research on pharmacist MSF should therefore include a thorough evaluation of potential rater biases and explore strategies to mitigate them, such as incorporating more objective measures of the competencies being assessed.

6.1.7 Reliability

The MSF process in this study demonstrated strong internal consistency for both peer and non-peer ratings, evidenced by Cronbach's alpha values of 0.89 and 0.87, respectively. Although these values are robust, they fall slightly below the ≥ 0.90 threshold commonly reported for physician MSF processes, suggesting potential differences in MSF within pharmacy settings compared to medical settings (Archer, 2008; Donnon et al., 2014; Hall et al., 1999; Lockyer et al., 2006; van der Meulen et al., 2017; Violato et al., 2003). It is noteworthy that studies that achieve higher levels of internal consistency are associated with a minimum of eight peer and eight non-peer raters (Donnon et al., 2014). In this study, the limited number of ratees having at least eight peer and eight non-peer raters underlines the broader challenge of ensuring high internal consistency in MSF processes, which depends on a diverse and balanced rater pool.

In the post-MSF process survey, both raters and ratees perceived the MSF process as reliable. Although these subjective assessments do not replace formal reliability measures, they provide valuable insights into the perceived trustworthiness and consistency of the MSF process. Future research should focus on increasing the recruitment rate of ratees and raters

and exploring and defining the minimum number of raters (peers and non-peers) to maximize reliability while maintaining feasibility and acceptability. Further discussion is located in sections 6.2.1 and 6.2.2 of this manuscript under recruitment process.

6.1.8 Validity and Reliability Conclusion

This study provided valuable insights into the validity and reliability of an MSF process for hospital/healthcare-system pharmacists, revealing both strengths and areas for improvement in its design, implementation, and outcomes. The findings demonstrate that the MSF process was generally perceived as valid, reliable, and useful for assessing key competencies such as communication, collaboration, and professionalism. However, important limitations emerged, including challenges related to content and construct validity, potential biases introduced through self-selection of raters, and reservations among peer raters regarding MSF's ability to foster meaningful behavioural change. The study also highlighted significant threats to external validity due to a low response rate, which may limit the generalizability of the findings to broader pharmacy settings.

6.2 Feasibility and Acceptability

6.2.1 Rater Recruitment

Despite the recruitment efforts in this study, only ten pharmacists initially consented to participate, and one later withdrew due to difficulty securing the required number of raters. Ultimately, nine pharmacists completed the study, representing just 2.5% of hospital pharmacists in Saskatchewan (SCPP, 2024). While a small sample size is not unusual in pilot studies, this low response rate limits the generalizability of the findings and highlights the challenges of recruiting for MSF studies.

Voluntary response sampling was utilized in this study because it can help to ensure that participants are genuinely willing to engage in the feedback process, which may lead to more honest and thoughtful responses. Voluntary participants are likely to be more motivated and committed to providing and receiving constructive feedback, enhancing the overall quality and reliability of the data collected (Tripepi et al., 2010). Additionally, this method can be more practical and feasible in a professional setting where mandatory

participation might be difficult to enforce and could lead to resistance or superficial participation. However, voluntary sampling can lead to self-selection bias, where participants who volunteer may differ systematically from those who do not, potentially skewing the results (Tripepi., 2013). This method may also result in a non-representative sample, making the findings less generalizable to the larger population of pharmacists. The ratee recruitment methods for this study included email invitations and a virtual presentation by the student investigator. Email invitations, sent via the email lists, either directly or through pharmacy directors, were a cost-effective way to reach all hospital/healthcare-system pharmacists simultaneously. However, as noted by Harrap et al. (2023), email communication often suffers from low engagement rates due to busy schedules and high volume, which could lead to potential participants overlooking or deprioritizing study-related emails.

It is not known how many potential ratees did not meet the inclusion criteria if they did not practice direct patient care for 20% of their allocated work time. Canadian Institute of Health Information data from 2022 reports that 66% of pharmacists nationally were employed in direct patient care (Canadian Institute for Health, 2022.). However, their definition of direct patient care is “registrants who provided services directly to clients”, which differs from the definition used in this study.

The virtual presentation provided an opportunity for direct interaction with potential participants, offering real-time clarification of study objectives and emphasizing the importance of participation. This approach catered to pharmacists in diverse locations and accommodated their busy schedules by being more accessible than in-person meetings. However, virtual presentations may lack the personal connection of face-to-face interactions and are susceptible to technical issues, which can reduce engagement (Cheng et al., 2023). Virtual presentations would likely be the most feasible option for regulatory bodies to implement, as their licensees would be geographically spread.

To enhance ratee recruitment, future implementation could consider offering incentives like continuing education credits or financial compensation. Offering remuneration, whether financial or in the form of continuing education credits, could boost participation rates by compensating pharmacists for their time and effort. While this strategy acknowledges the value of their contributions, it also carries the risk of attracting participants more interested in the incentives than in meaningful professional development, potentially

compromising the reliability of the data.

To enhance participation and streamline the recruitment process, future MSF studies could consider partnering with professional organizations such as the provincial college of pharmacists, university pharmacy colleges, or other healthcare professional organizations in medicine, dietetics or nursing. These partnerships could facilitate broader outreach and engagement by leveraging established networks and relationships. A reciprocal approach, where organizations collaborate to support each other's professional development initiatives, could increase buy-in and participation across disciplines. Such collaborations could also provide access to shared resources, improve the feasibility of large-scale implementation, and foster interdisciplinary learning and feedback, ultimately enriching the MSF process.

Leveraging technology, such as online platforms for assessments, can facilitate participation by making the process more accessible and less time-consuming for raters. A specialized platform, like the MCC 360, which is designed specifically for multi-source feedback, offers distinct advantages over more generic tools such as SurveyMonkey®. The MCC 360 provides a streamlined and user-friendly interface that can be tailored to the unique requirements of MSF, facilitating smoother navigation and reducing the burden on ratees and raters (Medical Council of Canada, n.d.). Additionally, its ability to automatically generate collated feedback reports in real time allows for more efficient analysis and interpretation of data, enhancing both the timeliness and the quality of feedback. This can help reduce manual processing efforts and increase the feasibility of implementation by regulatory bodies. By integrating such dedicated technology, the MSF process can become more accessible but also more scalable, ensuring a higher level of engagement and participation while maintaining the integrity and rigor of the evaluation. However, it is worth noting that none of the ratees or raters in this study reported any issues with using the technology for the MSF process, indicating that the platform employed (i.e. SurveyMonkey®) was user-friendly and efficient.

The recruitment materials (**Appendix C1, Appendix C2, Appendix C3**) and the virtual presentation primarily highlighted the role of MSF in competency assessment. It was anticipated that emphasizing this aspect, along with its potential application by regulatory bodies, would encourage pharmacists to participate in the pilot study. However, it is also possible that this focus on competency assessment may have deterred participation due to its

potentially negative connotations. Ratees may have perceived the process as evaluative rather than formative or developmental. To increase participation in future MSF studies, it may be more effective to emphasize the formative nature of MSF and its role in promoting self-improvement and professional growth, rather than focusing solely on its use for competency assessment.

If the MSF process was to become a mandatory regulatory requirement, concerns surrounding the recruitment of ratees would likely diminish. In voluntary research-based settings, participation can often be hindered by recruitment challenges, including individuals' reluctance to engage or a perceived burden associated with the process (Patel, 2003). However, when MSF is mandated as part of a regulatory framework, participation becomes a standard professional obligation, reducing the variability and hesitancy that might otherwise arise in voluntary contexts. This shift would streamline the recruitment process, ensuring consistent participation and engagement across a broad range of individuals, as compliance would be tied to regulatory expectations rather than individual discretion. Consequently, the focus of the MSF process would likely shift from overcoming recruitment barriers of ratees to optimizing the quality and reliability of the feedback provided, thus enhancing its overall feasibility and effectiveness in practice.

6.2.2 Rater participation rates

One of the primary challenges in this study was the difficulty ratees faced in identifying and securing the necessary number of peer and non-peer raters. The challenges in securing raters might reflect broader issues within the professional environments of the ratees. For example, ratees working in smaller or more specialized teams might struggle to identify a sufficient number of peers and non-peers who are both familiar with their work and willing to participate. Additionally, time constraints and workload pressures may have discouraged potential raters from agreeing to participate. This challenge in finding raters is evidenced by the lack of commentary from both the withdrawn pharmacist and the two participants who required the ethics amendment when followed up with by the student investigator. Their silence suggests a potential discomfort or difficulty in securing raters that

they were unwilling or unable to articulate. A better understanding of these challenges is critical to addressing the feasibility of implementing MSF in the pharmacy setting.

Similar to the strategies discussed above concerning ratees, offering financial remuneration or continuing education credits could potentially aid in recruiting more raters. However, the same drawbacks would persist. Providing financial incentives might lead to raters not acting in the best interests of the ratee. Additionally, while offering continuing education credits may be feasible for peer raters within the same regulatory body, securing such credits for other regulated professions would require substantial effort and may not be an option for non-regulated raters, such as administrative staff, pharmacy assistants or patients.

Both peer and non-peer raters may lack familiarity with the MSF process and its importance in professional development, which can reduce their motivation and the quality of their feedback. This was a concern brought up by a participant “Raters gave feedback that they were hesitant to participate as they were unsure of the quality of their feedback and uncomfortable with their own skills in providing feedback”. Without proper training or understanding of how MSF supports the ratee's growth, raters may see it as a mere administrative task and provide superficial or incomplete evaluations, which could undermine the reliability and validity of the feedback (Sadler et al., 2017). Therefore, providing clear guidance and training is essential to ensure meaningful participation and high-quality feedback from raters. However, implementing such training could introduce logistical and resource challenges for regulatory bodies, as they would need to develop and oversee standardized training programs relevant to multiple professions to ensure consistent and credible assessments.

Another option to address the challenges in recruiting raters is to decrease the required number of raters for the MSF process. While this adjustment could reduce the burden on ratees and potentially improve participation, it must be carefully balanced against several potential drawbacks. Fewer raters would result in a smaller pool of feedback, which may diminish the richness and utility of the feedback provided. Additionally, with fewer raters, there is an increased risk of unblinding, as ratees may be able to identify who provided specific feedback. This could undermine the anonymity and candidness of

responses. One participant noted, "There is a big possibility that the survey would not be anonymous. Example: you ask 6 people and only 2 complete the survey. It is quite likely you could discern who said what based on the comments. This can make others hesitant to participate if they were asked to assess someone who is not doing well (i.e., would not be as honest due to fear of not being anonymous)". Finally, ensuring sufficient reliability of the feedback with fewer raters would be critical, as a reduced sample size could introduce greater variability and affect the validity of the assessment.

The inability to determine the total number of raters contacted by each participant introduces a limitation in assessing the full scope of challenges in identifying raters. Without this information, it is difficult to gauge whether the low response rate among raters was due to a lack of engagement from those contacted, or if ratees were simply unable to contact enough potential raters. This ambiguity highlights, the need for clearer tracking and reporting of rater recruitment efforts in future studies.

Before this study began, the S CPP competency assurance program task force noted a concern: patients often do not realize hospitals employ pharmacists, and even if they do, they may not fully understand the pharmacists' role. This aligns with the literature that shows poor patient insight into the role of hospital pharmacists (King et al., 2017; Low et al., 2020; Morecroft et al., 2015; Rosenthal et al., 2010). In Canadian analyses, Gould et al. (2013) showed that hospitalized patients recognized pharmacists as sources of medication information, and Doucette et al. (2013) found that while most patients did not remember speaking to a pharmacist during a recent admission, they would have liked to speak to a pharmacist if one was available. Slack and Ing (2009) found that only 20.9% of patients surveyed two months after discharge from a hospital in Canada recalled ever speaking with a pharmacist during their hospitalization. This is in addition to the pre-existing literature for MSF in pharmacists (Patel et al., 2009, 2011; Davies et al., 2013) which did not include patients as raters. As a result, patients were excluded from the MSF in this study. Future studies should explore the feasibility and validity of incorporating patients into MSF processes for hospital and healthcare-system pharmacists, as patients can provide unique insights into competencies such as communication, collaboration, and professionalism

6.2.3 Time to Complete

MSF questionnaires can vary considerably in the number of questions they contain. Donnon et al. (2014) found substantial variation depending on the rater type, with self-assessment questionnaires containing between 4 and 57 items, peer assessments ranging from 4 to 60 items, and non-peer assessments also spanning from 4 to 60 items in physician MSF studies. Patel et al. (2009) reported using 15 competency-based questions for raters to assess pharmacists' performance. In comparison, the present study featured 18 identical statements for both ratees and raters, positioning it favorably in terms of question count relative to these previous studies.

The time commitment for participants to complete the MSF process varied, with ratees reporting the longest time to complete (mean of 22 minutes) followed by peer raters (mean 14.5 minutes) and non-peer (mean 10.3 minutes). It is important to note that the reported time for ratees only reflects the self-assessment component and does not include the additional time required for reviewing their collated report or meeting with the student investigator for facilitated discussion. This is reassuring, as the process of self-reflection should take a significant amount of time. It is possible that peers, being more familiar with the responsibilities and requirements of the profession may take longer to provide an in-depth assessment as compared to non-peers. The low end of the range for self-assessment (5 minutes) and rater assessments (2 minutes) reflects the variability in time commitment to the process and raises questions about the quality and depth of assessments and feedback. These findings compare to the findings by Al Khalifi et al. (2013) which suggested that MSF is feasible when ratings by raters take between 6 and 15 minutes to complete. Future studies could examine in more depth the feasibility and time spent by ratees completing the self-assessment.

Despite the variation in time spent, the majority of non-peer raters did not find the process burdensome (74%), although approximately half (52.2%) of the peer raters suggested the time commitment was burdensome. This corresponds to the slightly longer time it took peer raters to complete the questionnaires.

The above findings suggest that while the time commitment for the MSF process is

generally acceptable, there may be a need to consider the additional burden placed on peer raters.

Peer raters might feel a greater responsibility to provide detailed and accurate feedback, leading to a perception of greater time demands, which was echoed in this free-text comment in the post MSF-process survey “I personally found the written feedback piece to be most time-consuming, especially when working on a busy ward”. Additionally, it could be that peer raters are also struggling with balancing the time to provide feedback vs. completing their patient care duties “The process can be time-consuming and administratively burdensome, potentially detracting from the focus on direct patient care and pharmacy operations”. This insight could inform future iterations of the MSF process, where adjustments might be made to either streamline the process for peer raters or provide additional support to mitigate the perceived burden. For example, this could include reducing the number of MSF questions, providing guidance on effective feedback or examples of succinct high-quality feedback, providing time estimates up front, as this study did, or allowing partial completion so raters could save progress and complete at a later time as this study did.

Ratees were less positive about the amount of time required to complete the questionnaire; over half (55.5%) considered it burdensome. The self-assessment component of the MSF process may have felt more demanding for ratees than for raters due to the need for in- depth self-reflection and the comprehensive nature of evaluating their own performance. This may have contributed to their perception of a greater time burden. In responding to the question ratees may also have considered the time needed to recruit raters, reflect on the collated report, prepare action plan and participate in the facilitated discussion as the question asked about the MSF process and not just completions of the self-assessment. Future iterations of the MSF process could consider these findings and develop strategies to reduce the time required for self- assessment as well as rater recruitment strategies and streamlining the entire process. This could include streamlining the MSF process to focus only on the most critical competencies and reducing the number of questions. Providing guidance documents and education on the benefits of and best practices in self-assessment may reduce the perception of burden without reducing the time for self-assessment. While streamlining the process is important, it is equally important to emphasize the value of the

time spent in self-assessment. Self-assessment is crucial for professional development, fostering self-awareness and continuous improvement (Silver, 2008), and the average of 22 minutes spent on this task should be considered time well spent. Rather than focusing solely on reducing the time, future efforts should also provide education on the benefits of self-assessment, helping ratees understand its long-term importance in their professional growth.

Additionally, ratees may have experienced a greater sense of burden compared to raters, as the MSF process for them involved additional tasks beyond self-assessment. These included recruiting peer and non-peer raters, reviewing and reflecting on the collated feedback report, creating SMART goals, and participating in the facilitated discussion. Unlike raters, whose primary responsibility was providing feedback, ratees engaged in a more comprehensive and time-intensive process. Although the total time required to complete all components of the MSF process was not explicitly measured, these additional responsibilities likely contributed to the perception of the process as burdensome for some ratees.

To address these concerns, guidance documents could offer practical tips for approaching the self-assessment and related tasks more efficiently, while emphasizing the developmental value of thoughtful reflection. For instance, offering strategies for effective rater recruitment, time management, and integrating feedback into actionable goals could help ratees navigate the process with greater ease. Additionally, ratees could benefit from receiving feedback on how their time spent compares to the average, along with tailored suggestions for optimizing their approach if they exceed this average. Acknowledging the time and effort ratees invest, and reinforcing the significance of this reflective exercise in professional development, may help reduce the perception of burden, reframing the time commitment as purposeful and worthwhile.

6.2.4 Post-MSF Process Survey

In the post-MSF process survey both peer and non-peer raters generally viewed the process positively, particularly regarding the clarity of instructions, simplicity of completion, and ease of recruitment. These findings suggest that the MSF process is largely user-friendly and manageable, supporting its practical application in professional settings. The high satisfaction ratings from the OSDS questions, with mean scores exceeding 4 for all bipolar

adjectives, further underscore the positive reception among raters. In the post-MSF process survey, differences emerged between peer and non-peer raters, with peers expressing concerns about the time required for participation and skepticism regarding the MSF process's potential to drive meaningful practice change. One peer rater remarked, "I do not believe it accurately captures competencies for pharmacists, especially in a smaller hospital setting," highlighting doubts about the process's relevance and applicability in certain contexts. Another commented on the "time-consuming process," emphasizing the burden associated with participation. These concerns highlight the need to address the unique challenges faced by peer raters, particularly in environments where feedback demands are high.

Ratees echoed similar themes of feasibility and acceptability but identified distinct challenges. While they generally found the MSF process clear and manageable, issues such as difficulty recruiting the required number of raters and concerns about the appropriateness of the recruitment process emerged as significant barriers. The results of the OSDS question also indicated high satisfaction ratings, with mean scores above 4. These scores are similar to those reported in the studies by Corbo et al. (2006) and Patel et al. (2009). However, the only adjective used in this study that was also included in both those studies was fair/unfair suggesting a comparable level of perceived fairness in the MSF process. Only one ratee successfully recruited the target number of raters, reflecting the need for enhanced guidance and support in this area. One ratee noted, "By explaining expectations better to raters, OR by having more questions that were most specific. The hardest part about recruitment was raters saying that they didn't know what was expected of them in providing feedback, or didn't feel comfortable providing feedback. If what was wanted was clearer, they might be more likely to fill it out".

Areas for future improvements should consider peer raters concerns regarding time commitment and their skepticism around the ability of the process to produce practice change while the area of most concern for ratees is recruiting raters. Peer raters' increased sense of burden may stem from several factors, including working in environments with a limited number of peers or relying on the same individuals to provide multiple ratings for different ratees. This can lead to burnout, as peer raters may feel overwhelmed if they are consistently asked to provide feedback across various MSF processes. As one participant noted, "As a

manager, completing one form is not at all burdensome. If all of my staff approached me to do this time would be an issue (60 FTEs)”. Non-peer raters may not have faced the same challenges as there may have been greater availability of non-peer raters.

To mitigate this, adjustments could be made to reduce the frequency of their participation by rotating the pool of peer raters, limiting the number of MSF requests a peer can receive within a given period or reducing the number of peer raters as long as the MSF process remains valid and reliable. Additionally, alternative ways to streamline peer involvement could include simplifying the feedback process by reducing the number of assessment criteria, or utilizing technology to guide raters through more efficient responses. Another approach might be introducing peer feedback groups or circles, where peers provide collective feedback in a single session, thereby distributing the effort among several colleagues rather than placing the full burden on a few individuals. However, various mitigation strategies will have benefits and drawbacks that would need to be considered (e.g. if a ratee received very low ratings would they be hesitant to participate in a group session?).

In parallel, efforts should be made to improve the recruitment process for ratees, ensuring they can engage the required number of raters more easily. In this study, the guidelines for recruitment were selecting peer and non-peer raters whom the ratees have worked with in the past year and know them well enough to provide meaningful feedback. While this is a reasonable starting point, more specific guidelines with detailed criteria could be provided to help ratees understand the ideal characteristics of a rater, such as the type and frequency of interactions with the ratee, and the raters position or role relative to the ratee (e.g. supervisor, team member). This may enhance the quality and ease of rater selection. Offering support could also play a crucial role, such as establishing a centralized system to assist ratees in recruiting raters that could automate the process of reaching out to potential raters, inviting them to participate, and managing their responses. This would save ratees from the administrative burden of manually contacting each rater and tracking their participation. Another option could involve setting up a roster of pre-identified, qualified raters willing to participate in the MSF process. Another approach to reducing the burden of rater recruitment could involve lowering the required number of raters, provided the validity and reliability of the MSF process are maintained.

While these initiatives could undoubtedly streamline the recruitment process and reduce the burden on ratees, they would likely impose a significant logistical and financial burden on organizations such as regulatory bodies. Implementing centralized systems or pre-identified rater rosters would require considerable resources for development, management, and ongoing maintenance, which may not be feasible in all settings. The practicality of such measures must be critically assessed, particularly in resource-limited contexts where simpler, more cost-effective solutions may be more appropriate. For instance, providing clearer recruitment guidelines and offering basic administrative support could still enhance the ease of rater selection without imposing excessive demands on the organizations responsible for administering the MSF process. Thus, while more elaborate recruitment systems could benefit future iterations of MSF, their applicability must be balanced against the available resources and the specific needs of the context in which they are implemented.

6.2.5 Qualitative Feedback

The open-ended responses from both ratees and raters provide additional insights into the acceptability and feasibility of the MSF process. The responses to “why would you recommend or not recommend the MSF process?” from ratees were exclusively negative, indicating some reservations among ratees regarding the value of the process. For instance, one participant noted, “I would not recommend this process to a colleague because it was time consuming to find enough people to complete the survey. I did not find it helpful on how to facilitate change in my current practice. I also do not understand how a subjective rating scale such as a survey is supposed to measure an objective outcome such as competency as a pharmacist; as such, this can be influenced both positively and negatively by the way raters complete their questionnaire.” Additional comment responses were more evenly distributed showing both the perceived challenges and areas where participants see potential for improvement. A ratee highlighted: “Overall I think the MSF process is a useful process. The biggest issues were the time commitment (takes significant time to answer the questions in depth), and recruitment. While recruiting is viable, it again takes a large amount of time. I think MSF is great, but would need a lot of work on how to implement it smoothly. Considering how short health care is on resources, I think if it's not easy to actually complete, people will 'complete' it but not actually meaningfully complete it.”

Among raters, a larger dataset of 91 responses was analyzed. When considering both peer and non-peer raters together, the majority would recommend the MSF process, though a significant number expressed reservations. Only a small number of responses offered suggestions for improvement, indicating limited feedback on how the process could be enhanced.

Some raters highlighted the potential benefits of the MSF process. One respondent noted, “I think it would be very informative to experience getting feedback from the MSF process. I would like to know what others see as my personal strengths and weaknesses, and so I assume my professional colleagues likely feel similarly and would also benefit from the feedback received. It would be especially interesting to see feedback from beyond one's own profession, to better understand one's strengths and weaknesses from an interprofessional perspective.”

However, others expressed reservations about the process. A participant commented, “I wouldn't recommend the MSF process. I feel it should be up to the employer to assess their staff in a manner that suits their needs. Also, what does this survey really do for the individual?” Another noted challenges with the format of the feedback: “I find a comment of 'Keep doing...' and 'Stop doing...' is a helpful way to change practice. Most of the questions were aimed at competency, rather than professionalism. It would be hard to change practice based on simply ratings.”

Overall, the open-ended responses underscore the mixed perceptions of the MSF process, with non-peers generally finding it more acceptable than peers. However, the negative feedback from peer raters, along with the suggestions for improvement, indicates that there are aspects of the process that warrant further refinement to enhance both acceptability and feasibility.

6.2.6 Action Plans and Facilitated Discussions

The facilitated discussion following the completion of MSF had a positive impact on most ratees, who found the process affirming. Many ratees were surprised that the feedback was less critical than anticipated, which speaks to the acceptability of the MSF process. Ratees generally received feedback constructively and were open to self-reflection. This

underscores the value of such discussions in promoting reflective practice, even when feedback diverges from expectations.

Limitations existed in the structure of the facilitated discussions. The minimal instructions provided on how to develop action plans, combined with the conservative expectation that action plans only meet one component of the SMART criteria, may have limited the potential for ratees to create comprehensive and effective goals. Although 69% of ratees included SMART goals in their action plans, it remains unknown whether these were implemented successfully or led to meaningful changes in practice. The absence of follow-up limits understanding of the long-term impact and feasibility of the MSF process.

Behaviour change is the goal of MSF, therefore longitudinal evaluation with coaching should be examined in future studies of MSF in pharmacy as has been done with physicians (Curran et al., 2024; Roy et al., 2023). More trained coaches would become essential as seen in other studies (Curran et al., 2024; Roy et al., 2023). Longitudinal assessments would require ongoing support to ensure ratees not only receive feedback but also actively implement and reflect on developmental actions over time. Trained coaches would play a crucial role in facilitating this process by guiding ratees through the interpretation of feedback, setting measurable goals and creating action plans, monitoring progress toward behaviour change, adjusting action plans, and addressing emerging challenges. Moreover, having a greater number of trained coaches, ideally with expertise tailored to the ratee's specific practice environment, would ensure that feedback remains relevant and actionable. This approach would provide the necessary structure and support for ratees to translate feedback into meaningful, long-term behavioural improvements, thereby enhancing the overall validity and impact of the MSF process.

While incorporating more trained coaches into a longitudinal evaluation of behaviour change would enhance the depth and continuity of feedback, it would also introduce significant logistical and resource burdens. The recruitment, training, and coordination of a larger number of specialized coaches would require considerable investment in both time and finances. This increased demand for resources must be carefully balanced against the potential benefits. Organizations, like regulatory bodies, would need to assess whether the added value of personalized, ongoing coaching justifies the costs and operational complexity

involved. A number of studies strongly recommend the involvement of a trained peer coach or mentor to support ratees with the process of reflection and implementation of their action plans or goals on their MSF feedback (Francois et al., 2018; Lockyer et al., 2020; Overeem et al., 2010b; Schweltnus & Carnahan, 2014).

In summary, while the facilitated discussions in this study were largely constructive and well-received, expanding the coaching structure and providing clearer guidance on action plans could further enhance the MSF process. Incorporating follow-up would also increase the likelihood of long-term improvement. Future studies should explore the feasibility and impact of these refinements to maximize the benefits of MSF in pharmacy practice.

6.2.7 Feasibility and Acceptability Conclusion

This pilot study underscores the need for focused attention on rater recruitment and the time commitment required for ratees to complete the MSF process before the MSF process can be considered feasible. Achieving the target of eight peer and eight non-peer raters was problematic, with many ratees falling short of this expectation, thereby complicating the assessment of validity. The limited number of raters may have reduced the breadth of feedback, impacting the robustness and representativeness of the evaluation.

The feasibility issues are closely tied to validity concerns. The reduced pool of raters raises questions about whether the feedback adequately reflects ratee performance, making it difficult to draw reliable conclusions. Additionally, the time commitment was viewed as burdensome by some ratees, highlighting the need to balance thoroughness with practicality in future iterations of the MSF process.

Despite these challenges, post-MSF survey results indicated a high level of acceptability among ratees, suggesting the process holds potential if adapted. This positive response points to the MSF's value as a performance evaluation tool for Saskatchewan hospital/healthcare-system pharmacists, provided adjustments are made to improve rater recruitment and reduce the time burden.

6.3 Limitations

The major limitations of this study, which have been discussed previously in the manuscript, may have impacted the overall findings.

First, the study had a small sample size, with only nine ratees completing the MSF process, which limits the generalizability of the results and the ability to fully assess the process's validity, reliability, feasibility, and acceptability.

Second, recruiting the required number of raters (eight peers and eight non-peers) was a significant challenge, affecting the demonstration of strong reliability. A larger and more balanced rater pool is typically needed to ensure robust internal consistency. It is therefore unknown whether a lower number of peers and non-peers is sufficient to provide reliable feedback and secondly whether pharmacists could recruit the numbers required.

Third, raters were only allowed to complete the post-MSF survey once, even if they rated multiple ratees. This likely resulted in the loss of some valuable feedback about the process as in reality, if this process was implemented, raters may be asked to rate multiple ratees.

Fourth, this study did not include a longitudinal evaluation of behaviour change following MSF feedback, limiting the ability to assess the long-term impact on professional development. Future studies should track behaviour over time to better evaluate the effectiveness of MSF in fostering growth.

Fifth, the study's framing of the MSF process in the recruitment materials may have failed to highlight the formative aspects of the MSF process and implied a summative approach. While competency assessment can be formative if used to provide constructive feedback for growth, participants may have perceived the MSF process as a potential future high-stakes evaluative task rather than a developmental opportunity. This perception could have discouraged participation and led to less positive engagement with the process. Future iterations should ensure that the MSF process is clearly positioned as a formative tool, emphasizing its role in supporting professional development and continuous improvement to enhance participation rates and positive attitudes toward the process.

Chapter 7 Overall Conclusion

This pilot study of an MSF process for Saskatchewan hospital/healthcare-system pharmacists provided valuable insights into its validity, reliability, acceptability, and feasibility. Conducting a pilot study like this can identify challenges early, allowing for adjustments to prevent the implementation of a poorly designed MSF process.

The study findings reveal that in a small pilot study MSF was perceived as a valid, reliable, and useful tool for fostering development in key competencies such as communication, collaboration, and professionalism. However, several limitations merged, including content and construct validity issues, and peer raters' reservations about MSF's capacity to drive meaningful behavioural change. The study also identified significant threats to external validity due to low response rates and potential sampling biases, which may limit the generalizability of these findings to broader pharmacy settings.

Feasibility issues were closely tied to validity concerns, such as achieving the target number of peer and non-peer raters proved challenging, with many ratees falling short of this goal. This reduced rater pool may have constrained the amount of feedback, impacting the robustness and representativeness of the evaluation. Furthermore, the time commitment required for the MSF process was seen as burdensome by some ratees, suggesting a need to balance thoroughness with practicality in future MSF implementations.

Despite these challenges, post-MSF survey results indicated a high level of acceptability among ratees, underscoring MSF's potential as a performance evaluation tool if adapted to address identified limitations. Positive feedback from both ratees and raters highlights MSF's promise to contribute to professional development within Saskatchewan's hospital/healthcare- system pharmacy context, particularly with modifications to improve rater recruitment and reduce the time burden.

In summary, this pilot study underscores the potential of MSF as a tool for professional development. However, to optimize its validity, reliability, feasibility, and acceptability, future studies or implementation of MSF should focus on reducing biases, refining recruitment strategies, and implementing structured support systems. Additionally, future research should explore the role of MSF as a tool for providing formative feedback that fosters professional development, as well as its potential focus as a competency assessment instrument. These improvements will be critical for integrating MSF successfully into hospital/healthcare-system pharmacy practice and maximizing its value as a tool for professional growth.

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Appendices

Appendix A: Literature review search strategy

Appendix B: Summary of studies involving MSF for healthcare professionals

Appendix C1: MSF process invitation

Appendix C2: MSF program description and ratee consent

Appendix C3: Rater invitation and consent

Appendix D: Example collated MSF report

Appendix E: R2C2 tri-fold guide

Appendix F: Consent email for ethics amendment for study inclusion

Appendix G: MSF questions mapped to NAPRA professional competencies for Canadian Pharmacists at entry to practice

Appendix H: MSF ratee self-assessment

Appendix I: MSF questionnaire and post-MSF questionnaire for raters

Appendix J: Post-MSF questionnaire for ratees

Appendix K: Structured tabular thematic analysis

Appendix L Post MSF-process survey open-text responses

Appendix A: Literature review search strategy (June, 2023)

OVID Medline

Search #	Search term	Results
1	"multi-source feedback".mp.	88
2	"multisource feedback".mp	188
3	"360 review".mp.	1
4	multi source assessment.mp.	5
5	multisource assessment.mp.	27
6	multi-rater feedback.mp.	5
7	multirater feedback.mp.	2
8	360-degree feedback.mp.	53
9	360 feedback.mp.	7
10	MSF.mp.	1285
11	Clinical competence/	105,166
12	10 and 11	85
13	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 12	354
14	pharmac*.mp.	4,215,329
15	14 and 15	8
16	physician.mp. Or Physicians/	333,725
17	doctor.mp.	53800

18	medical doctor.mp.	1335
19	medical practitioner.mp.	1373
20	16 or 17 or 18 or 19	371,010
21	13 and 20	121
22	nursing.mp. Or Nursing/	622,053
23	nurse.mp.	182,650
24	22 or 23	679,676
25	13 and 24	34
26	physiotherapist .mp. Or Physical Therapists/	6200
27	13 and 26	1
28	occupational therapist.mp. Or Occupational therapists	2047
29	Occupational therapy.mp. Or Occupational Therapy/	18442
30	OT.mp.	27995
31	28 or 29 or 30	46439
32	13 and 31	2
33	Social Workers/ or social work*.mp.	29044
34	13 and 33	0
35	Dietitian.mp. Or Nutritionists/	4611

36	13 and 35	0
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PubMed

Search terms	Results
((("MSF") AND (clinical competence[MeSH Terms])) OR ((("multi-source feedback") OR ("multi source assessment") OR ("multisource feedback") OR ("multi-source assessment") OR ("multisource assessment") OR ("multi-rater feedback") OR ("multirater feedback") OR ("360 - degree feedback") OR ("360 feedback")))) AND ((("physician") OR (physician[MeSH Terms]) OR ("doctor") OR (doctor[MeSH Terms]) OR ("medical doctor") OR (medical doctor[MeSH Terms]) OR ("medical practitioner"))))	148
((("MSF") AND (clinical competence[MeSH Terms])) OR ((("multi-source feedback") OR ("multi source assessment") OR ("multisource feedback") OR ("multi-source assessment") OR ("multisource assessment") OR ("multi-rater feedback") OR ("multirater feedback") OR ("360 - degree feedback") OR ("360 feedback")))) AND ((("nursing") OR ("nurse") OR (nurse[MeSH Terms]) OR (nursing[MeSH Terms]))))	47
((("MSF") AND (clinical competence[MeSH Terms])) OR ((("multi-source feedback") OR	6

<p>("multi source assessment") OR ("multisource feedback") OR ("multi-source assessment") OR ("multisource assessment") OR ("multi-rater feedback") OR ("multirater feedback") OR ("360 - degree feedback") OR ("360 feedback")) AND (("pharmacy") OR ("pharmacist*") OR (pharmacy[MeSH Terms]) OR (pharmacist*[MeSH Terms]))</p>	
<p>((("MSF") AND (clinical competence[MeSH Terms])) OR (((("multi-source feedback") OR ("multi source assessment") OR ("multisource feedback") OR ("multi-source assessment") OR ("multisource assessment") OR ("multi-rater feedback") OR ("multirater feedback") OR ("360 - degree feedback") OR ("360 feedback")) AND (("physiotherapist") OR ("physical therapy") OR (physiotherapist[MeSH Terms]) OR (physical therapy[MeSH Terms]))))</p>	2
<p>((("MSF") AND (clinical competence[MeSH Terms])) OR (((("multi-source feedback") OR ("multi source assessment") OR ("multisource feedback") OR ("multi-source assessment") OR ("multisource assessment") OR ("multi-rater feedback") OR ("multirater feedback") OR ("360 - degree feedback") OR ("360 feedback")) AND (("occupational therapist") OR ("occupational therapy") OR ("OT") OR (occupational therapist[MeSH Terms]) OR</p>	2

<p>(occupational therapy[MeSH Terms]))</p>	
<p>((("MSF") AND (clinical competence[MeSH Terms])) OR ((("multi-source feedback") OR ("multi source assessment") OR ("multisource feedback") OR ("multi-source assessment") OR ("multisource assessment") OR ("multi-rater feedback") OR ("multirater feedback") OR ("360 - degree feedback") OR ("360 feedback")))) AND (("social work*") (social work*[MeSH Terms])))</p>	<p>0</p>
<p>((("MSF") AND (clinical competence[MeSH Terms])) OR ((("multi-source feedback") OR ("multi source assessment") OR ("multisource feedback") OR ("multi-source assessment") OR ("multisource assessment") OR ("multi-rater feedback") OR ("multirater feedback") OR ("360 - degree feedback") OR ("360 feedback")))) AND (("dietitian") OR ("nutrition") OR (dietitian[MeSH Terms]) OR (nutrition[MeSH Terms])))</p>	<p>2</p>

Appendix B: Summary of studies involving MSF for healthcare professionals

Study	Setting and Design	Intervention	Outcome	Findings	Strengths/weaknesses
Linn et al. (1986)	<ul style="list-style-type: none"> -Internal medicine residents -Faculty members -USA -N=71 residents -N=16 faculty members 	<ul style="list-style-type: none"> -raters included: two registered nurses, three nurses aids, one social worker, and four clerical members 	<ul style="list-style-type: none"> -Rated physicians on a 5-point Likert-scale with 18 questions -Focusing on physician friendliness, warmth, and responsiveness to patients' needs. 	<ul style="list-style-type: none"> -Resident and faculty assessments were moderately correlated suggesting measurement of the same underlying attribute 	<ul style="list-style-type: none"> -One of the first studies involving physicians being rated by “non-peers” or other healthcare professionals
Ramsey et al. (1993)	<ul style="list-style-type: none"> -Internal medicine physicians -USA -N=?? 	<ul style="list-style-type: none"> -Raters were selected either by rater or ratee supervisor -Raters were “professional associates” and included physician colleagues and nurses 	<ul style="list-style-type: none"> -Eleven raters were needed to generate a generalizability coefficient greater than 0.7 -Questions focused on humanistic, communication, and clinical skills of ratees/ 	<ul style="list-style-type: none"> -Ratings did not differ between both rater groups suggesting self-selection didn't affect validity 	<ul style="list-style-type: none"> -Another early study on the use of MSF in physicians with peer raters. -Noted that it was difficult for ratees to find 11 raters or professional associates -In the discussion it was noted that some physicians may be uncomfortable with the feedback received and it is unknown what the legal ramifications of this process could entail (i.e. low ratings)

<p>Wright et al. (2012)</p>	<p>-Range of physician specialties/practice settings</p> <p>-UK</p> <p>N=1065</p>	<p>-Raters included 10 physician and 10 non-physician colleagues.</p> <p>-raters also included 45 consecutive patients during their visits</p>	<p>-Cronbach's alpha = 0.87 for patients and 0.94 for colleagues.</p> <p>-G coefficient greater than 0.7 with 34 patients and 15 colleagues</p>	<p>-Patients who identified their visits as very high important gave higher ratings</p> <p>-Colleagues who had greater contact gave higher ratings</p>	<p>-Overall participation rate was 43% (compared to 17% in previous literature)</p> <p>-MSF was not mandatory so it was difficult to tell the true range of professional performance</p> <p>-Self-selection of raters for both physician and non-</p>
					<p>physician colleagues (potentially for bias to choose raters you know would rate you more highly)</p> <p>-Did not validate MSF questionnaire results against direct observation of practice, skills, and knowledge.</p> <p>-No formal analysis of free-text feedback due to volume of feedback received</p>

<p>Van Der Muelen Et al. (INCEPT) (2017)</p>	<p>-Range of 26 specialties/practice settings</p> <p>-Netherlands</p> <p>-N=218</p>	<p>-Raters included peers, residents, and other healthcare professionals' self-selected by the rater</p>	<p>-Rated physicians on a five-point Likert scale assessing CANMED's roles of collaboration, communication, and professionalism.</p> <p>-Cronbach's alpha was 0.89 for peers, 0.88 for residents, and 0.91 for coworkers.</p>	<p>-The minimum number of evaluations to obtain reliable scores is three peers, three residents, and three to four other healthcare professionals</p>	<p>-Range of specialties/practice settings show generalizability but difficult to make assumptions about individual specialties</p> <p>-By narrowing qualitative feedback into positive or negative miss out on any nuances</p> <p>-Were able to perform EFA and CFA to establish validity</p>
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<p>Archer et al. (SPRAT) (2005)</p>	<p>-Pediatric physicians (including residents)</p> <p>-UK</p> <p>-N=20 middle grade physicians</p> <p>-N=92 senior house officers</p>	<p>-Raters included senior house officers, middle grades, nurses, consultants, and other healthcare professionals</p>	<p>-Rated physician on a six-point Likert scale assessing the five domains of UK general medical council Good Medical Practice over 24 questions</p>	<p>-Mean time to distribute MSF questionnaire was 25 minutes</p> <p>-Mean time to complete the questionnaire by a rater was six minutes</p> <p>-Postulated to only need 4 raters each for reliability</p> <p>-Overall, it was considered feasible by both raters and ratees</p>	<p>-Overall, it took about an hour of administration time from contacting doctor to completed form</p> <p>-Linear regression to find associations between grade of doctor, length of relationship with rater, occupation of rater. Only the grade of doctor was found to be significant.</p> <p>-First major published work on MSF feedback in the UK</p>
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<p>Archer et al. (Mini-PAT) (2008)</p>	<p>-Trainee physicians (year 1 and 2)</p> <p>-UK</p> <p>-N=553</p>	<p>-Minimum of 6 raters who could include physician supervisors, nurses, and other healthcare professionals</p>	<p>-Developed from the SPRAT but removed 9 questions</p> <p>-Used six-point Likert scale to assess five domains of Good Medical practice.</p> <p>-Cronbach's alpha was 0.98</p>	<p>-Mean time of completion was 7 minutes (Range 1- 50 minutes)</p> <p>-7% of variation in raters explained by working relationship, occupation, and working environment when controlled for year of physician</p>	<p>-Good construct validity as junior trainee physicians compared to more senior trainee physicians had lower ratings overall</p> <p>-Required more assessors than the SPRAT to get sufficient reliability</p>
<p>Lockyer et al. (2006)</p>	<p>-Anesthesiologists</p> <p>-Canada</p> <p>-N=168</p>	<p>-Each anesthesiologist was assessed by eight medical colleagues, eight coworkers, and 30 patients</p>	<p>-Surveys with 11, 19, 29 and 29 items were developed for patients, coworkers, medical colleagues and self, respectively, using five-point Likert scales with an 'unable to assess' category</p>	<p>-Relatively few items with high percentages of 'unable to assess'.</p> <p>-Mean ratings for all questions were between 4 and 5 with no outliers</p>	<p>-Low response rate for patients (56.2%)</p> <p>-On the patient survey, items related to decision making and anesthetic options may not have been recalled subsequently when patients were responding</p>

			<p>-The items addressed communication skills, professionalism, collegiality, continuing professional development and collaboration</p> <p>-Assessed feasibility, reliability, and validity of the MSF program</p>	<p>-Factor analyses revealed a two-factor solution for the patient, a two-factor solution for the coworker and a three-factor solution for the medical colleague survey, accounting for at least 70% of the variance.</p> <p>-All instruments had a high internal consistency reliability (Cronbach's $\alpha > 0.95$).</p> <p>-The generalizability coefficients were 0.65 for patients,</p>	<p>-Good statistical analysis of feasibility, reliability, and validity with more than one methodology</p>
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				0.56 for coworkers and 0.69 for peers	
Violato et al. (2003)	-Surgeons -Canada (Alberta) -N=201	-Self-selection of 8 peers, 8 medical colleagues, and 25 consecutive patients in addition to self-assessment	-Surveys with 34, 19, and 39 items were developed for self-assessment and peers, medical colleague, and patients, respectively, using five-point Likert scales with an 'unable to assess' category -Self-assessment and medical colleague items examined communication, diagnostic and treatment skills, medical records,	-Overall, there were approximately 30% of questions (67/92) with high percentages of 'unable to assess' -The eigenvalues for each of the factors were greater than 1 and accounted for 69.0% of the total variance for the medical colleague instrument, 65.1% of the total variance for self, 69.8% of	-The factors derived from the exploratory factor analyses were consistent with the intent of each of the instruments and the overall areas identified for assessment -The mean ratings on all of the instruments were between 4 and 5 which is similar to previous physician MSF literature. -High percentage of "unable to assess" means some questions may not have been feasible or

			<p>transfer and coordination of care, respect for patients, collaboration, professionalism, ability to assess the medical literature, continuing learning, and stress management.</p> <p>-Medical colleague items used the same scale and focused on communication, collaboration, respect for patients and colleagues, accessibility, and support for colleague and coworker learning.</p> <p>-The patient questionnaire items focused on communication, respect, the office and</p>	<p>the total variance for coworkers, and 73.7% of the total variance for the patient instrument.</p> <p>-The mean ratings on all of the instruments were between 4 and 5</p> <p>-All of the Cronbach's alpha's reliability indices were > 0.90, indicating internally consistent instruments.</p> <p>- In the three-month follow-up survey 144 (71.6%) of the surgeons contemplated or initiated change on the basis of the</p>	<p>poorly understood by the raters</p> <p>-One of the few MSF studies that tested whether MSF actually led to practice change</p>
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			<p>office staff, and information received.</p> <p>-Assessed reliability, and validity of the MSF program</p>	<p>MSF provided to them.</p>	
<p>Fidler et al. (1999)</p>	<p>-Physicians</p> <p>-Canada</p> <p>-N=308 physicians</p>	<p>-Received feedback from 6 peer, 6 referring physicians, six co-workers, and 25 patients</p> <p>-Study examined if they would make changes to their practice based on feedback</p>	<p>-83% of the 255 physicians reported having contemplated a change, and 66% reported having initiated a change for at least one aspect of practice. Changes were contemplated most frequently for aspects of practice associated with clinical skills and resource use. Changes were initiated most frequently for aspects of practice associated with communication</p>	<p>- Physicians who contemplated or initiated changes had lower (i.e., more negative) mean ratings than did physicians who reported that no change was necessary, which suggests that the physicians did use their feedback ratings to decide about changes. Printed material was chosen most</p>	<p>-One of the few studies looking at the consequential validity of MSF and if it led to performance improvement or change.</p> <p>-Future studies could dive more in depth into what physicians mean when they say “change contemplated” “change initiated” etc. to examine what actually occurred.</p>

			with patients and support of patients	often as a method of receiving continuing medical education related to making changes in the practice areas examined.	
Lipner et al. (2002)	<ul style="list-style-type: none"> -Physicians -United states -N=356 	<ul style="list-style-type: none"> -two self-rating surveys -10 peer surveys -25 patient surveys -1 quality improvement plan 	<ul style="list-style-type: none"> -Patient survey consisted of 10 items with a five-point Likert scale -Peer survey consisted of 11 items rated on a nine-point Likert-scale -self assessment survey rates both patient and peer survey items. -Focus on the action plans for the literature review. 	<p>Of the 83 physicians who completed quality improvement plans, 65% thought the feedback would help them improve the quality of medical care they provided. The majority (80%) reported they would routinely participate in self-reflection and 82% would continue to seek feedback from</p>	<ul style="list-style-type: none"> -Only assessed intent to change by the end of the module, did not follow up to see if implemented -Out of 356 participants only 83 completed the action plans, leading to a low overall number of participants completing -Similar to previous MSF studies. High overall mean ratings for patients and peers. (4.8 for patients and 7.9 for peers)

				<p>patients and peers.</p> <p>Forty-two percent reported their intent to change communication strategies with their patients, while 28% reported they would change their communication strategies with their peers.</p>	
Roy et al. (2023)	<p>-Physicians</p> <p>-Canada</p> <p>-N=50</p>	<p>-Linked data for 50 physicians who completed the MCC 360 to determine action plan completion status after 6 months</p>	<p>-Evaluated if physicians completed all their improvement plans</p> <p>-Completed any of their improvement plans</p> <p>-Completed none of their improvement plans</p>	<p>-The 50 physicians created 142 quality improvement plans</p> <p>-13 physicians (26%) completed all 36 of their plans.</p> <p>-18 (36%) had completed at least one of their 52 plans</p> <p>-19 (38%) and not yet completed any of their 54 plans.</p>	<p>-Most plans were themed within the roles targeted by the MSF tool with most addressing the communicator role, professional, and collaborator CanMEDS roles.</p> <p>-Notable findings include that physicians who were unable to implement improvement plans had fewer repeated messages, had difficult plans, or needed to involve others.</p>

				<p>-Of the 142 individual plans created, physicians reported 63 (44%) had been completed, 66 (47%) were in progress, and 13 (9%) had not yet been started.</p>	<p>-This highlights areas MSF should focus on to ultimately lead to performance behaviour and change.</p>
<p>Curran et al. (2024)</p>	<p>-Attending physicians</p> <p>-Canada (Newfoundland)</p> <p>-N=34 physician participants</p> <p>-N=13 peer coaches</p>	<p>-22 physicians participated in two coaching sessions, and 8 took part in one coaching session.</p> <p>18 physicians took part in the post-assessment survey and follow up.</p>	<p>-20 questions in a pre/post assessment of readiness for self-directed learning</p> <p>-11 questions around overall satisfaction with the program and peer coaching</p> <p>-Additional thematic analysis key themes in open ended comments and interview questions</p>	<p>-Participants reported significant improvement in their readiness for self-directed learning</p> <p>-Overall participants were satisfied with peer coaching (94.4% agree or strongly agree)</p>	<p>-One of the few MSF studies to include facilitated coaching at the end of an MSF process, which had great satisfaction in this study</p> <p>-Small sample size and singular jurisdiction limit generalizability</p> <p>-Notable that 100% of participants would recommend this program to a colleague</p>

<p>Crossley et al. (2015)</p>	<p>-Nurses -UK -N=558</p>	<p>-Self-selection of 15 raters who were either physicians, nurses, allied healthcare professionals, or clerical/managerial staff</p>	<p>-Assessed 6 dimensions based on the United Kingdom Department of Health, knowledge, and skills framework. -Questions used a four-point Likert scale</p>	<p>-Found to be acceptable and feasible to complete from both raters and ratees, but IT access was a potential barrier to complete.</p>	<p>-One of the first studies looking at MSF in nurses -60% response rate showed feasibility -Narrow sample size (Only hospital nurses from two hospitals) limits generalizability</p>
<p>Cormack et al. (2018)</p>	<p>-Graduate nurses -USA -N=54</p>	<p>-Graduate nurses were rated on 4 OSCE evaluations by a faculty member, standardized patient, self-assessment, and a preceptor</p>	<p>-Standardized patients used a survey to assess -Faculty used a grading rubric for each OSCE scenario -Students were given a video of their OSCE performance and had to write a self-reflection -Preceptors gave midterm and end of semester evaluations</p>	<p>-Both students, faculty, and preceptors found the MSF process useful for assessing performance and identifying opportunities for behaviour change</p>	<p>-Limited generalizability as study done in nursing graduates -Looked at OSCE pass rates, but difficult to make a conclusion (100% with MSF, 97% pre-MSF) -Open-text comments from students on self-reflection were positive and it seems MSF process was acceptable</p>

<p>McPhee et al. (2017)</p>	<ul style="list-style-type: none"> -Graduate nurses -Australia -N=16 	<ul style="list-style-type: none"> -Graduate nurses received feedback from a nursing unit manager, clinical nurse educator, preceptor, and self-assessment -Clinical nurse educators also participated in a semi-structured interview 	<ul style="list-style-type: none"> - Received feedback on 18 statements reflecting core nursing competencies -Post completion questionnaire for intervention and control groups 	<ul style="list-style-type: none"> -Graduate nurses found that formal feedback from more than one rater enhanced their ability to self-assess their own competencies. -expressed concern with receiving feedback from a preceptor that they did not frequently work with when compared to a self-selected mentor. -The clinical nurse educators found that the graduate nurses improved based on the MSF process when compared to the prior single appraisal process 	<ul style="list-style-type: none"> -Limited generalizability with graduate nurses to compare to more experienced nurses as well as three sites -Difficult to analyze data from post-completion questionnaire due to low numbers -Thematic analysis uncovered mostly positive themes, however graduate nurses expressed concern about how to choose raters, especially in a formal workplace setting and assessment
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<p>Violato et al. (2009)</p>	<p>-Occupational therapists</p> <p>-Canada (Ontario)</p> <p>-N=238</p>	<p>-12 co-workers and 15 clients were involved as raters</p>	<p>-Rated occupational therapists on a five-point Likert scale</p> <p>-28 questions on co-worker questionnaire</p> <p>-14 questions on the patient questionnaire</p> <p>-Cronbach's alpha was 0.97 across both questionnaires</p> <p>-Exploratory factor analysis was able to derive 7 co-worker factors and 4 patient factors</p>	<p>-Both MSF questionnaires were found to have a high degree of feasibility and acceptability from participants</p>	<p>-Limited generalizability as single jurisdiction in Canada</p> <p>-Established psychometric properties of MSF process, but requires further study on if it actually resulted in changing practice</p>
<p>Hensingboon et al. (2017)</p>	<p>-Student Physical therapists</p> <p>-Thailand</p> <p>-N=40</p>	<p>-Raters were clinical educators, fellow students, patients, and they also completed a self-assessment. The number of raters was not reported.</p>	<p>-Used a questionnaire to assess. Questions and total number not reported.</p> <p>-Assessed competence requirements in physical therapy profession, such as professional behaviour, communication, and patient management.</p>	<p>-The absolute G-coefficient was 0.86 while the relative G-coefficient was 0.88</p>	<p>-Difficult to assess the study as several key details were not reported. How many raters and the number and type of questions would be key.</p> <p>-Found to have good reliability through G-study</p>

<p>Patel et al. (Pharmacy Mini-PAT) (2009)</p>	<p>-Junior hospital pharmacists -UK -N=27</p>	<p>-5 to 8 raters (involved in learning in the past 6 months)</p>	<p>-Rated pharmacist on a 1-6 scale with open-ended comments on 15 competencies</p>	<p>-Feedback questionnaire from ratees assessed the mini-PAT as fair, useful, interesting, good, and effective -Good balance of narrative comments centered around three themes (positive, negative,</p>	<p>-First study for pharmacist MSF -Notable that ratees wanted to “unblind” assessors and see who gave what ratings and feedback so they could follow up. However, more honest feedback is usually given with blinded assessment.</p>
				<p>suggestions for improvement)</p>	

<p>Patel et al. (2011)</p>	<p>-Junior hospital pharmacists</p> <p>-UK</p> <p>-N=633 assessments</p>	<p>-Same as above but done every six months for three years.</p> <p>Different registration years (e.g. Group A underwent five assessments)</p>	<p>-Looked at response rate from assessors who could be pharmacists, pharmacy technicians, and other healthcare professionals</p> <p>-Looked at mean rating from different healthcare professionals to see if there was a difference in ratings (used kruskal-wallis test)</p>	<p>-Response rate was 77% which was considered acceptable for MSF and considered practical</p> <p>-Found that nurses and physicians give higher ratings than pharmacists</p> <p>-Higher scores in areas of communication and collaboration which is similar to that of junior doctors in the SPRAT study.</p> <p>Therefore, a balanced list of</p>	<p>-23% of non-responders did not have information on which profession they were (e.g. were the majority of non-responders physicians?)</p> <p>-Difficult to generalize to practicing pharmacists and to other countries where pharmacy practice may differ greatly</p>
				<p>peers vs non-peers may be important</p>	

<p>Davies et al. (2013)</p>	<p>-Junior hospital pharmacists</p> <p>-UK</p> <p>-N=578</p> <p>-9625 assessments</p>	<p>-Junior hospital pharmacists did the Mini-Pat every six months using 5-8 assessors</p>	<p>-Compared self-assessment, rater assessment, and reported cohort mean assessments</p>	<p>-5.2% of total ratings were “unable to assess” with the majority of those being in the delivery of patient care</p> <p>-Improvement noted for almost all junior pharmacists</p> <p>-Self-assessments were typically lower than assessor ratings</p> <p>-Pharmacy assessors tended to rate lower than physicians or nurses</p>	<p>-Noted that there was no training of the assessment tool for non-pharmacists. Although, this is true for most MSF literature done using other healthcare professionals as assessors.</p> <p>-Junior pharmacists were able to choose own assessors, which may impact truthfulness of ratings but improves feasibility of process</p>
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Appendix C1: MSF process invitation

Recruitment email for pharmacists (December 1, 2023)

Subject: Invitation to participate in multi-source feedback for hospital pharmacists!

Hello,

You are invited to participate in a multi-source feedback (MSF) pilot study entitled: *A pilot study of an MSF process for hospital pharmacists in Saskatchewan*

Pharmacists have an ethical obligation to [“maintain a high standard of professional competence throughout their practice”](#). As part of an ongoing review of their competency assurance programs, many regulatory authorities are considering multi-source feedback (MSF) as a way for practicing pharmacists to gather, interpret, reflect, and act upon feedback provided about their practice quality from peers (pharmacists) and non-peers (e.g. pharmacy technicians, physicians, nurses, dietitians, etc.) and to use this process to ensure the competency of registrants.

With reviews from the people who know you best, MSF can improve communication and collaboration with peers and non-peers and enrich patient care. MSF can empower pharmacists to reflect on their practice and improve their performance. With the MSF process, you can receive actionable insight and use that to reflect on key competencies like communication, collaboration, and professionalism.

An opportunity exists to develop an MSF program for hospital pharmacists in Saskatchewan that could be used by regulatory authorities in the future. However, we need you to pilot-test it and provide feedback! Additionally, this is an opportunity for you to receive feedback from the people you work with who know you best. This feedback is formative (i.e. not used to assess you) and can provide the opportunity to affirm your practice, identify areas to improve on, and improve self-reflection skills.

Please see the attached document (MSF Program description) for a description of the study and what is required for participation. To summarize, you will complete an MSF self-assessment, identify, and contact 16 raters who will rate you. Then you will receive a collated

report and have a facilitated discussion with the student investigator before completing a post-MSF process survey. Please also see the attached PDF (MSF collated report – sample) for an example of what MSF may look like, including comments. Participation eligibility: Direct patient-care practice in a hospital pharmacy setting (including ambulatory care) for at least 20% of your scheduled work hours. If you are a part of the medicine/emergency pharmacy team at Royal University Hospital you are excluded from participating in the study.

For this study, the definition of direct patient care is pharmaceutical care by pharmacists who work directly with patients and other healthcare professionals to prevent, identify, and resolve drug-related problems. For example, a hospital pharmacist who only works in the dispensary or in a technical role would not be eligible to participate. Whereas a pharmacist providing pharmaceutical care for at least 20% of their scheduled work hours on the ward and interacting with other healthcare professionals would be eligible. If you are interested, please reply to this email, or don't hesitate to reach out if you have further questions.

University of Saskatchewan Behavioural Research Ethics Board has reviewed and approved this study (ID 4342)

Thanks!

Jeff

Jeff Herbert, BSP ACPR MSc Student, College of Pharmacy & Nutrition, University of Saskatchewan

Appendix C2: MSF program description and ratee consent

Ratee consent and MSF program description

You are invited to participate in a research study entitled: *Pilot study of a Multi-source feedback process for hospital pharmacists in Saskatchewan*

Objective and Impact of the Research:

- **Objective:** To establish the validity and reliability of a multi-source feedback (MSF) process and to assess its feasibility and acceptability.
- **Purpose:** Ultimately the results of this study can help to inform future MSF programs for hospital pharmacists in a way that can enhance their competency while also being feasible and acceptable.
- **Potential benefits:** First and foremost, the benefit to you, assuming that the MSF questionnaire is valid, is the opportunity to receive feedback from peers and non-peers to help identify strengths and areas of potential growth as a pharmacist to enhance your practice and deliver optimized patient care. This feedback will not be shared with anyone outside of the student investigator and will not be used to assess your performance in practice. It may provide you with an opportunity to affirm your practice, identify areas of potential growth, and improve self-reflection skills. Although competency assessment can be a sensitive and anxiety-provoking topic, it is of utmost importance to a self-regulating profession. Pilot testing and gathering feedback from frontline practicing pharmacists about the feasibility and acceptability of the MSF process will allow us to improve the process for potential future use by regulatory bodies.

Information and Consent:

- **Researchers:**

Jeff Herbert MSc Student

College of Pharmacy & Nutrition, University of Saskatchewan

Jeff.Herbert@usask.ca

Dr. Yvonne Shevchuk

Professor Emerita, College of Pharmacy & Nutrition, University of Saskatchewan

Yvonne.shevchuk@usask.ca

Procedures:

- Electronic questionnaire
 - 1) You are invited to first assess yourself using the MSF questionnaire, delivered via SurveyMonkey while also recording how long it took you to complete. Please complete the self-assessment within thirty days of receiving the link to the questionnaire.
 - 2) You can then identify 8 peers (i.e. pharmacists) and 8 non-peers (e.g. pharmacy technicians, physicians, nurses, dietitians, physiotherapists, etc.) who will be asked to complete the questionnaire and provide ratings and comments on various competencies related to professionalism, collaboration, and communication. Peers and non-peers are people with whom you currently work or have worked with in the past year. Choose peers and non-peers who know your work and performance and can provide constructive feedback on your strengths and areas of development. Patients you care for are not part of this MSF feedback process. If less than three of your peer or non-peer raters complete the MSF questionnaire and rate you, you will be excluded from the study.
 - 3) You will be provided with an introductory email that you can use to explain the study to the selected peers and non-peers. Explain to your selected peers and non-peers that this is part of a pilot study testing this MSF process and that their valuable input will help inform competency assessment for hospital pharmacists. Their responses will remain anonymous. After they complete the MSF process, they will complete a second short questionnaire relating to the feasibility and acceptability of the MSF process from their perspective. Please instruct your

peers/non-peers to complete their rating of you within thirty days of receiving the link.

- 4) You will be asked to send a reminder to your chosen raters at approximately day 15 reminding them to complete their rating of you.
- 5) Once all your raters have provided ratings (or the study period ends) you will receive a collated report of your MSF feedback. along with a survey to assess the feasibility and acceptability of the MSF process.
- 6) After you have received a collated report, you will be contacted by the student investigator to participate in a short (30 minutes) facilitated discussion about your MSF report. This facilitated discussion will include creating action plans based on the feedback you have received in your MSF report. Certain aspects of facilitated discussion will be collected for the manuscript and analysis (1. General reaction to the feedback 2. Did you create an action plan(s), 3. How many action plans did you create, 4. Does at least one of your action plans target your lowest-scoring competency, and 5. how many of your action plans followed a SMART format). This facilitated discussion will not be recorded. Data will be reported in aggregate and reported anonymously. After the facilitated discussion you will receive a survey to assess the validity, reliability, feasibility, and acceptability of the MSF process delivered via SurveyMonkey.
- 7) This collated feedback will be anonymized during analysis and results will be presented in the written manuscript.

Note: It is advisable to complete the MSF questionnaire on a computer as opposed to a mobile device to ensure the reliability of the responses.

Potential Risks:

- There are no foreseeable physical, social, or legal risks to participants. The only possible risk would be psychological or emotional based on the sensitive topic and sometimes the personal nature of competency assessment and feedback, where survey questions or responses could lead to respondents feeling stressed or upset. All information from you will be collected confidentially.

- Your decision to participate or not will not affect your employment, academic standing, or how you will be treated.
- The student researcher (i.e. Jeff Herbert) will be the only individual with access to identifiable responses. Committee members will only have access to the de-identified information. From the free text responses, it may be possible that we could identify individuals based on their responses. The data will remain confidential during analysis and results will be reported in aggregate.
- Pharmacists who may encounter emotional distress by seeing or answering responses have the ability to identify and obtain any necessary supportive services from the Saskatchewan Health Authority.
SHA: employee and family assistance program - 1-844-336-3136.

Confidentiality:

- The data collected will be shared in a thesis manuscript as well as potentially journal publications or poster presentations. Pharmacist participant's name, self-assessment ratings, and peer/non-peer ratings of the pharmacist participant will not be anonymous to the primary investigator who requires the information to collate a final report to be distributed to the individual pharmacist participant. The student investigator will keep a master list that connects the participants' names to their codes separate from the data during data collection and analysis. The master list will be destroyed after the successful completion of the student defense. Consent forms will be kept in a file separate from the data. Peer/non-peer rater information and responses will be anonymous. Information contained in the manuscript or publications will be deidentified and any quotations will be under a pseudonym. Survey responses will be presented in aggregate which will also help to preserve anonymity.
- These questionnaires (self-assessment, rater assessment, and post MSF-process survey) are hosted by SurveyMonkey®. SurveyMonkey® is a leading website survey platform that promises best-practice data security protocols and storage and adheres to transparent privacy regulations. All questionnaire information will be collected, retained and hosted on a third-party server and not on a U of S

server. Your data will be stored in facilities hosted in Canada. Your information is subject to SurveyMonkey's Privacy Policy. Please see the following for more information on SurveyMonkey's privacy policy:

<https://www.surveymonkey.com/mp/legal/privacy/>. As soon as a survey is complete or otherwise concluded, the primary investigator will remove the survey and any related data from SurveyMonkey.

- Under exceptional circumstances, the Chair of the Behavioural Research Ethics board or their designate may need to review your responses to check whether the information collected for the study is correct and to ensure that the study followed the required laws and guidelines.

Storage of Data:

- Electronic data will be stored on a password-protected computer during analysis but will be moved to a University of Saskatchewan DATASTORE® folder for long-term storage.
- Data will be stored for five years post-publication. After the storage period and when data is no longer required it will be destroyed beyond recovery
- Identifying information (e.g., Collated reports, pharmacist participant self-assessment, and peer/non-peer ratings) will be stored in a separate DATASTORE® Folder that only the student investigator will have access to. Consent forms will also be stored in a separate DATASTORE® folder and separate from the data. When data collection and analysis are complete, and they are no longer required they will be destroyed beyond recovery.
- The primary investigator (Dr. Y Shevchuk) will be responsible for the security and storage of the de-identified data.

Right to Withdraw:

- Participation in this survey is voluntary.
- You can decide not to participate at any time by closing your browser. If there is a statement you do not feel comfortable assessing, please select "unable to assess" and provide commentary on why you were unable to answer. Survey responses will

remain anonymous except for the student investigator. If you wish to withdraw at any time, please contact the student investigator.

- Withdrawal deadline: Within 30 days of completing the post-MSF survey.

Compensation:

- No compensation is offered for this study.

Questions or Concerns:

- Contact the researcher(s) using the following information:
 - Email: Jdh136@usask.ca
- This research study has been approved on ethical grounds by the University of Saskatchewan Behavioural Research Ethics Board (ID 4342). Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office: ethics.office@usask.ca; 306-966-2975; out-of-town participants may call toll-free 1-888-966-2975.

Signed Consent:

- Your signature below indicates that you have read and understand the description provided.
- I have had an opportunity to ask questions and my questions have been answered. I consent to participate in the research study. A copy of this consent form has been given to me for my records.

_____	_____	_____
<i>Name of participant</i>	<i>Signature</i>	<i>Date</i>
_____	_____	
<i>Researcher's Signature</i>	<i>Date</i>	

A copy of this consent will be given to you, and a copy will be kept by the researcher.

Ratee consent for post MSF-process survey

You are invited to participate in a research study entitled: *Pilot study of a multi-source feedback process for hospital pharmacists in Saskatchewan – post MSF survey.*

As a reminder here are the purpose and objectives of the study which are the same as the original consent form. This portion of consent is related to the post MSF-process survey.

Objective and Impact of the Research:

- **Objective:** To establish the validity and reliability of a multi-source feedback (MSF) process and to assess its feasibility and acceptability.
- **Purpose:** Ultimately the results of this study can help to inform future MSF programs for hospital pharmacists in a way that can enhance their competency while also being feasible and acceptable.
- **Potential benefits:** Pilot testing and gathering feedback from peer and non-peer raters about the feasibility and acceptability of the MSF process will allow us to improve the process for potential future use by regulatory bodies.

Information and Consent:

- **Researchers:**

Jeff Herbert MSc Student

College of Pharmacy & Nutrition, University of Saskatchewan

Jeff.Herbert@usask.ca

Dr. Yvonne Shevchuk

Professor Emerita, College of Pharmacy & Nutrition, University of Saskatchewan

Yvonne.shevchuk@usask.ca

Procedures:

- Electronic questionnaire
 - You are invited to complete a post-MSF process survey to gather your thoughts on the validity, reliability, feasibility, and acceptability of the MSF process you have just completed.

Note: It is advisable to complete the post MSF-process survey on a computer as opposed to a mobile device to ensure the reliability of the responses.

Potential Risks:

- There are no foreseeable physical, social, or legal risks to participants. The only possible risk would be psychological or emotional based on the sensitive topic and sometimes the personal nature of competency assessment and feedback, where survey questions or responses could lead to respondents feeling stressed or upset. All information from you will be collected anonymously.
- Some questions in the post MSF-process survey contain an option for open-ended comments. It may be possible for the student and primary investigator to identify you from your response to these comments.
- Your decision to participate or not will not affect your employment, academic standing, or how you will be treated.

Confidentiality:

- The data collected will be shared in a thesis manuscript as well as potentially journal publications or poster presentations. Peer and non-peer raters information will be anonymous. Survey responses will be presented in aggregate, which will also help to preserve anonymity, and any quotations will be under a pseudonym.
- This questionnaire is hosted by SurveyMonkey®. SurveyMonkey® is a leading website survey platform that promises best-practice data security

protocols and storage and adheres to transparent privacy regulations. All questionnaire information will be collected, retained and hosted on a third-party server and not on a U of S server. Your data will be stored in facilities hosted in Canada. Your information is subject to SurveyMonkey's Privacy Policy. Please see the following for more information on SurveyMonkey's privacy policy: <https://www.surveymonkey.com/mp/legal/privacy/>. As soon as a survey is complete or otherwise concluded, the primary investigator will remove the survey and any related data from SurveyMonkey.

- Under exceptional circumstances, the Chair of the Behavioural Research Ethics board or their designate may need to review your responses to check whether the information collected for the study is correct and to ensure that the study followed the required laws and guidelines.

Storage of Data:

- Electronic data will be stored on a password-protected computer during analysis but will be moved to a University of Saskatchewan DATASTORE® folder for long-term storage.
- Data will be stored for five years post-publication. After the storage period and when data is no longer required it will be destroyed beyond recovery.
- The primary investigator (Dr.Y Shevchuk) will be responsible for the security and storage of the de-identified data

Right to Withdraw:

- Participation in this survey is voluntary.
- Once you have submitted your data it will be unable to be withdrawn due to its anonymity.

Compensation:

- No compensation is offered for this study

Questions or Concerns:

- Contact the researcher(s) using the following information:
 - Email: Jdh136@usask.ca
 - Email: yvonne.shevchuk@usask.ca
- This research study has been approved on ethical grounds by the University of Saskatchewan Behavioural Research Ethics Board (ID 4342). Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office: ethics.office@usask.ca; 306-966-2975; out-of-town participants may call toll-free 1-888-966-2975.

By completing and submitting this questionnaire, your free and informed consent is implied and indicates that you understand the above conditions of participation in this study.

Appendix C3: Rater invitation and consent

Invitation email for peers/non-peers to participate

Subject: Invitation to provide multi-source feedback for **(insert name here)**

Hello,

I'd like to invite you to provide feedback on my professional practice as a registered pharmacist practicing in a direct patient care environment in Saskatchewan. Your feedback, along with feedback from my other colleagues will be regarded as entirely developmental (a formative assessment) as it will highlight my strengths as well as areas of potential growth. This feedback is part of a master's thesis study from the University of Saskatchewan.

Please provide your feedback using the multi-source feedback questionnaire (link below) by XX/XX/XXXX (30 days from when this email invitation has been sent). The feedback questionnaire should take you approximately fifteen to twenty minutes to complete. Each statement is based on a five-point Likert scale and also has a free-text box for additional comments. I encourage you to leave comments for areas I do well in as well as may require growth.

Thank you for taking the time to support my development as a pharmacist

LINK:

Kind regards,

Rater consent and MSF program description

You are invited to participate in a research study entitled: *Pilot study of a multi-source feedback process for hospital pharmacists in Saskatchewan.*

Objective and Impact of the Research:

- **Objective:** To establish the validity and reliability of a multi-source feedback (MSF) process and to assess its feasibility and acceptability.
- **Purpose:** Ultimately the results of this study can help to inform future MSF programs for hospital pharmacists in a way that can enhance their competency while also being feasible and acceptable.
- **Potential benefits:** Pilot testing and gathering feedback from peer and non-peer raters about the feasibility and acceptability of the MSF process will allow us to improve the process for potential future use by regulatory bodies.

Information and Consent:

- **Researchers:**

Jeff Herbert MSc Student

College of Pharmacy & Nutrition, University of Saskatchewan

Jeff.Herbert@usask.ca

Dr. Yvonne Shevchuk

Professor Emerita, College of Pharmacy & Nutrition, University of Saskatchewan

Yvonne.shevchuk@usask.ca

Procedures:

- Electronic questionnaire

- You are invited to assess your pharmacist colleague using the MSF questionnaire, delivered via SurveyMonkey, while also recording how long it took you to complete the questionnaire.
- After assessing your pharmacist colleague, you will be asked to complete a post-MSF process survey to gather your thoughts on the validity, reliability, feasibility, and acceptability of the MSF process you have just completed.

Note: It is advisable to complete the MSF questionnaire on a computer as opposed to a mobile device to ensure the reliability of the responses.

Potential Risks:

- There are no foreseeable physical, social, or legal risks to participants. The only possible risk would be psychological or emotional based on the sensitive topic and sometimes the personal nature of competency assessment and feedback, where survey questions or responses could lead to respondents feeling stressed or upset. All information from you will be collected anonymously. Although your pharmacist colleague has provided your name, there is no way of knowing whether you completed the questionnaire or to enable the pharmacist to determine who provided specific ratings or comments.
- Due to the MSF questionnaire containing an option for open-ended comments it may be possible for the pharmacist to identify you from your responses to these open-ended comments. If less than three of your pharmacist colleagues peer or non-peer raters complete the MSF questionnaire and rate your pharmacist colleague, your data will be excluded from the study.
- Your decision to participate or not will not affect your employment, academic standing, or how you will be treated.

Confidentiality:

- The data collected will be shared in a thesis manuscript as well as potentially journal publications or poster presentations. Peer and non-peer raters information

will be anonymous. Survey responses will be presented in aggregate, which will also help to preserve anonymity, and any quotations will be under a pseudonym.

- This questionnaire is hosted by SurveyMonkey®. SurveyMonkey® is a leading website survey platform that promises best-practice data security protocols and storage and adheres to transparent privacy regulations. All questionnaire information will be collected, retained and hosted on a third-party server and not on a U of S server. Your data will be stored in facilities hosted in Canada. Your information is subject to SurveyMonkey's Privacy Policy. Please see the following for more information on SurveyMonkey's privacy policy: <https://www.surveymonkey.com/mp/legal/privacy/>. As soon as a survey is complete or otherwise concluded, the primary investigator will remove the survey and any related data from SurveyMonkey.
- Under exceptional circumstances, the Chair of the Behavioural Research Ethics board or their designate may need to review your responses to check whether the information collected for the study is correct and to ensure that the study followed the required laws and guidelines.

Storage of Data:

- Electronic data will be stored on a password-protected computer during analysis but will be moved to a University of Saskatchewan DATASTORE® folder for long-term storage.
- Data will be stored for five years post-publication. After the storage period and when data is no longer required it will be destroyed beyond recovery.
- The primary investigator (Dr. Y Shevchuk) will be responsible for the security and storage of the de-identified data.

Right to Withdraw:

- Participation in this survey is voluntary.

- Once you have submitted your data it will be unable to be withdrawn due to its anonymity.

Compensation:

- No compensation is offered for this study.

Questions or Concerns:

- Contact the researcher(s) using the following information:
 - Email: Jdh136@usask.ca
 - Email: yvonne.shevchuk@usask.ca
- This research study has been approved on ethical grounds by the University of Saskatchewan Behavioural Research Ethics Board (ID 4342). Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office: ethics.office@usask.ca; 306-966-2975; out-of-town participants may call toll-free 1-888-966-2975.

By completing and submitting this questionnaire, your free and informed consent is implied and indicates that you understand the above conditions of participation in this study.

Appendix D: Example collated MSF report

Your Multi-Source Feedback Report

Mickey Mouse

June.22, 2023

YOUR MULTI-SOURCE FEEDBACK (MSF) REPORT

This MSF report is a compilation of data returned through questionnaires completed by your peers, non-peers, and self-assessment. The report content is confidential and is only shared with you and the student investigator. This MSF process was developed with the purpose of providing formative feedback to support pharmacist practice improvement, assess competencies, and pilot test the process for possible use by regulatory authorities. While acknowledging your feedback data may be influenced by external or systematic factors outside your control (e.g., patient to pharmacist ratios, patient flow, pharmacy department operations, etc.), multi-source feedback offers insight into others' perceptions of your practice and provides an opportunity for self-reflection and improvement.

National Association of Pharmacy Regulatory Authorities (NAPRA) competencies

Your MSF is mapped into various competencies as guided by the NAPRA competencies for Canadian Pharmacists at entry to practice. Through the MSF process, and by using peers and non-peers who know your practice the best, we hope this feedback can empower you to self-reflect on your practice and improve your performance. With the actionable feedback you've received, we hope that you can increase your competency and improve and enrich patient care.

Ratings in Your Report

Respondent groups are denoted as:

- SA = self-assessment
- PH = peer-assessment
- NP = non-peer assessment

Respondents indicated their level of agreement with statements using the following 5-point scale:

Strongly disagree (1) Disagree (2) Neutral (3) Agree (4) Strongly agree (5)

An additional "Unable to assess" option was available for respondents to indicate if they were unable to respond to a statement either because they did not have an opportunity to observe a

behaviour, could not remember, or for some reason did not feel it was a relevant item for them to respond. If your respondent chose unable to assess this score was removed from the results.

The ratings presented in this report are based on the feedback data provided by:

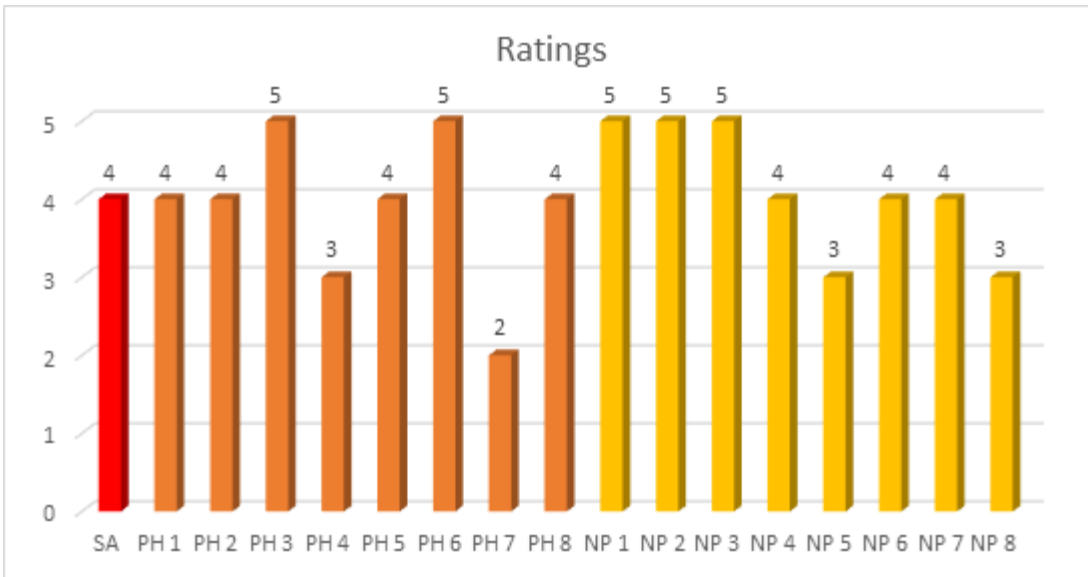
Total PH responses	Total NP responses	Self-assessment response
8	8	

Collated MSF report

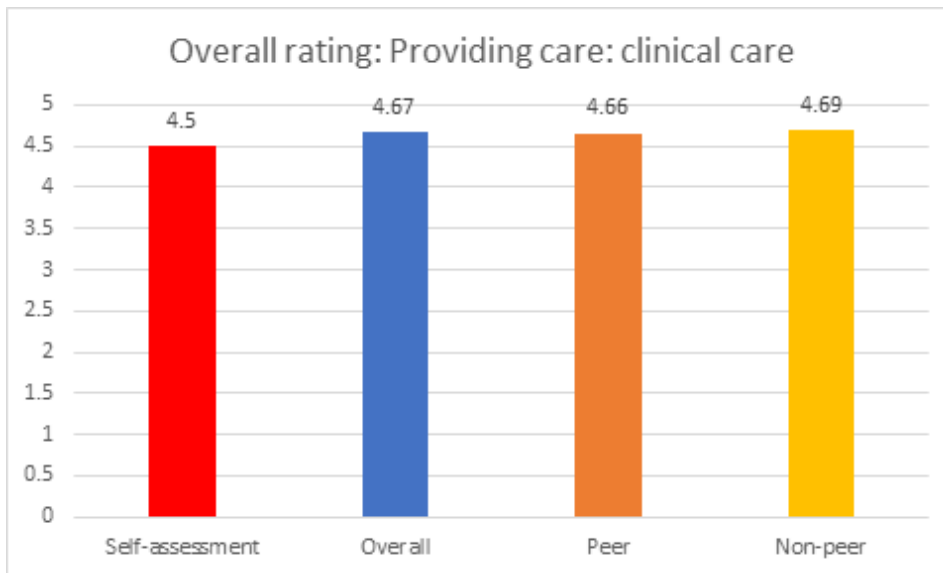
1. This pharmacist places the best interests of the patient as a principal priority
NAPRA competency: (Professionalism)

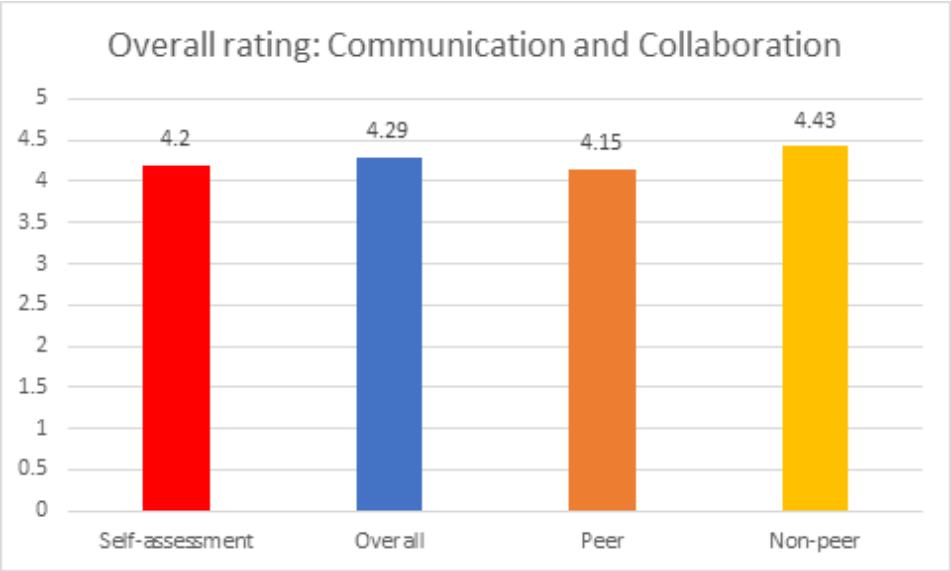
Open ended comments:

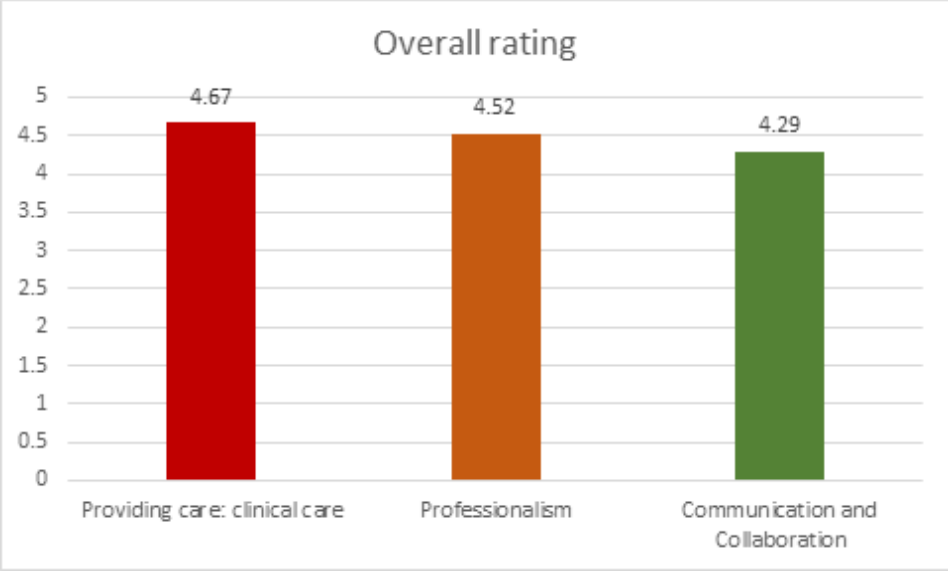
Respondent group	Respondent answer
Peer	Individual is patient centered however at times allows other considerations to come into play e.g. - want to leave early etc., wants to avoid conflict with physician caregiver
Peer	Patient focused - meets regularly with patients to identify goals of therapy.
Peer	Always keeps patient focus when engaging in work in the dispensary
Non-peer	She is quite caring and goes above and beyond
Non-peer	Pharmacist stayed late to be sure all communication was taken care of, and the patient's chart was up to date before leaving.
Non-peer	On rounds will also maintain patient focus when making recommendations to the team



Example of Overall ratings:







Appendix E: R2C2 Tri-fold guide

Stage 1. Build relationship

Goal: To engage the pharmacist, build relationship, mutual respect, and trust.

Explain the purpose of the report and the review, i.e., to share information about how they are doing; for them to describe their training and experiences; determine data identifying opportunities for improvement.

Outline the agenda: to review performance data and gaps; discuss their reactions to the data and what it means to them, and co-develop an action plan from the data.

Introduce yourself and describe your practice.

Phrases and Strategies:

Tell me about your experience in completing the assessment and preparing for this meeting.

I'd like to hear about your workplace (setting, patients, colleagues, challenges, things you enjoy, things that make your practice unique).

What struck you about the report?

Confirm what you are hearing; empathize; show respect; build trust and validate.

Relationship-building is central and needs attention throughout the discussion.

Stage 2. Explore reactions and reflections on the data/report

Goal: To ensure the pharmacist feels understood and that their views are heard and respected.

Phrases and strategies:

What were your initial reactions? Were there areas that particularly struck you?

Did anything in the report surprise you? Tell me more about that...

How do these data compare with how you thought you were doing? Any surprises?

Based on your reactions, is there a particular part of the report that you would like to focus on?

Negative reactions/surprises tend to be more frequently elicited by:

Lack of concrete examples in the report

Data identify areas where one is not doing as well as one thought.

Be prepared for expression of negative reactions in these cases. Support the expression of negative reactions using general facilitative approaches and explore reasons for these reactions.

Stage 3: Confirm content

Goal: To ensure the pharmacist is clear about what the data mean for their practice and the opportunities they suggest for change.

Phrases and strategies:

Ask general questions initially, but be systematic

as the session goes on, to ensure that items that might impact patient safety or are priorities for achievement are covered.

Were there things in the report that didn't make sense to you?

Anything you are not clear about?

Let's go through the report section by section

Is there anything in section [X] that you'd like to explore further or comment on?

Anything that causes you to think of how this might impact patient safety?

Anything that struck you as something to focus on?

Do you recognize a pattern?

When I reviewed the report, I noticed [X], what are your thoughts about that data?

Knowledge of the clinical work and areas where opportunities frequently arise for improvement can be helpful.

Stage 4: Coach for change and co-create an action plan

Goal: To ensure pharmacist identifies areas for change and develops an achievable action plan.

Phrases and strategies:

The pharmacist needs to understand, reflect upon and assimilate the content of the report before being able to plan for change.

Consider coaching as the skill of co-creating a specific action plan.

And in the next 3 and 6 months – what would you like to see changed?

What action steps might you take to reach these goals?

What is your timeline?

What resources do you need?

What will help you succeed?

What might get in the way?

What are your strategies to overcome barriers?

How will you measure success and know you have been successful?

Action Plan

Describe specific, observable change/s you intend to make. For each:

What is your goal?

What specific actions do you need to take?

When will you begin?

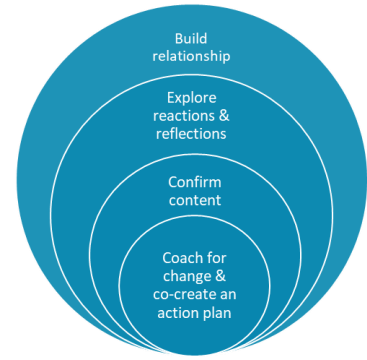
When do you think you will see results?

What resources will you need? Who can help you? What learning might you need?

What might get in the way of making the changes?

How will you overcome that?

How will you know you have achieved your goal?



R2C2

Evidence-Informed
Facilitated Feedback and
Coaching

Pharmacist Version

Adapted from: Sargeant et al., Academic Medicine, 2015, 2018; Armson et al., Medical Education, 2019.

To be used in discussions with pharmacists about their performance data. Further information about the R2C2 model and videos may be found at <https://medicine.dal.ca/departments/core-units/cpd/faculty-development/R2C2.html>

Appendix F: Consent email for ethics amendment for study inclusion

Subject: Participation in a pilot study of a multi-source feedback process for hospital pharmacists in Saskatchewan

Hello,

I am contacting you regarding your participation in my thesis study “A pilot study of a multi-source feedback process for hospital pharmacists in Saskatchewan”. Originally, participants were to be excluded from the study if they recruited less than three peer and/or non-peer raters. However, I have obtained an ethics amendment to allow your participation in the study based on recruiting at least three peers OR non-peer raters. If you consent, I would like to proceed with the next parts of the study (Collated report, facilitated discussion, post-MSF process survey) where the report and facilitated discussion will include data from ONLY the group, which had a minimum of three participants. Data from the other group will not be used. This will allow us to capture as much data as possible regarding the MFS process. Please reply to this email with your response.

Thank you,

Jeff Herbert, BSP ACPR MSc Student, College of Pharmacy & Nutrition, University of Saskatchewan

Appendix G: MSF questions mapped to NAPRA professional competencies for Canadian Pharmacists at entry to practice

Question (competency)

1. This pharmacist places the best interests of the patient as a principal priority (professionalism)
2. This pharmacist engages patients in shared decision-making (communication and collaboration)
3. This pharmacist respects patients' informed choices regarding healthcare decisions even if these conflict with their own (professionalism)
4. This pharmacist demonstrates respect and is non-judgmental of patients and co-workers regardless of gender, sexual orientation, ethnicity, or medical condition/disability (professionalism)
5. This pharmacist keeps their knowledge and skills up to date (professionalism)
6. This pharmacist respects professional boundaries (professionalism)
7. This pharmacist maintains confidentiality of information (professionalism)
8. This pharmacist identifies and resolves drug therapy problems (providing care: clinical care)
9. This pharmacist prioritizes resolving drug therapy problems (providing care: clinical care)
10. This pharmacist makes recommendations that are evidence-informed (providing care: clinical care)
11. This pharmacist accepts responsibility for their professional recommendations and actions (professionalism)
12. This pharmacist assumes responsibility for monitoring patient's response to therapy (providing care: clinical care)
13. This pharmacist verbally communicates their recommendations to both patients and colleagues in a clear and concise manner (communication and collaboration)
14. This pharmacist's written documentation facilitates collaboration and continuity of care (accurate, concise, and timely) (communication and collaboration)
15. This pharmacist establishes and maintains positive relationships with others to support collaborative care (communication and collaboration)

16. This pharmacist effectively manages conflict within the team (communication and collaboration)

17. This pharmacist appears to manage their stress effectively in the workplace (professionalism)

18. OVERALL, how confident are you in this pharmacist's medication and medication-use expertise?

Question	YS rating (2014)	YS Rating (2024)	JH Rating (2014)	JH Rating (2024)	Competency for report
1	Professionalism	Professionalism	Professionalism	Professionalism	Professionalism
2	Patient care	Communication and collaboration	Communication and Education	Communication and Collaboration	Communication and collaboration
3	Professionalism	Professionalism	Professionalism	Professionalism	Professionalism
4	Professionalism	Professionalism	Professionalism	Professionalism	Professionalism
5	Professionalism	Knowledge and Expertise	Patient Care	Knowledge and Expertise	Knowledge and Expertise
6	Professionalism	Professionalism	Professionalism	Professionalism	Professionalism
7	Professionalism	Professionalism	Professionalism	Professionalism	Professionalism
8	Patient Care	Providing care: clinical care	Patient Care	Providing care: clinical care	Providing care: clinical care
9	Patient Care	Providing care: clinical care	Patient care	Providing care: clinical care	Providing care: clinical care
10	Knowledge and Research Application	Knowledge and Expertise	Knowledge and Research Professionalism	Providing care: clinical care	Providing care: clinical care
11	Professionalism	Professionalism	Professionalism	Professionalism	Professionalism
12	Professionalism	Providing care: clinical care	Professionalism	Providing care: clinical care	Providing care: clinical care
13	Communication and Education	Communication and Collaboration	Communication and Education	Communication and collaboration	Communication and collaboration

14	Communication and Education	Communication and Collaboration	Communication and Education	Communication and collaboration	Communication and collaboration
15	Inter and Intraprofessional Collaboration	Communication and Collaboration	Inter and Intraprofessional Collaboration	Communication and collaboration	Communication and collaboration
16	Inter and Intraprofessional Collaboration	Communication and Collaboration	Communication and Education	Professionalism	Communication and collaboration
17	Professionalism	Professionalism	Professionalism	Professionalism	Professionalism

*Initially mapped as Professionalism in error

Appendix H: MSF ratee self-assessment (delivered via SurveyMonkey™)

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: MSF ratee self-assessment

Introduction

Thank you for participating in our pilot project of a multi-source feedback (MSF) questionnaire for hospital pharmacists in Saskatchewan as a questionnaire participant. Please read the following information.

Questionnaire Instructions:

There are 18 statements to complete that assess various competencies. After each statement, there is a free-text box to leave comments explaining the rationale for your rating. We encourage you to leave self-reflective comments as this will provide the most meaningful feedback that you can use to identify and reflect on areas of strength and improvement, especially if your raters either strongly disagree or strongly agree. The information you provide is only known to the student investigator (Jeff Herbert). You will be de-identified in any information provided to the research committee and the final manuscript.

The MSF questionnaire should take approximately fifteen to twenty minutes to complete. This will vary depending on the quality and length of your free-text comments. We encourage you to be thoughtful and thorough. There will be a question on the total amount of time it took you to complete the self-assessment so please keep track of when you started and finished.

This survey is hosted by SurveyMonkey®. All survey information will be collected, retained, and hosted on a third-party server and not on a U of S server. Your data will be stored in facilities hosted in Canada. Your information is subject to SurveyMonkey's Privacy Policy. Please see the following for more information on SurveyMonkey's® privacy policy: <https://www.surveymonkey.com/mp/legal/privacy/>. As soon as a survey is complete or otherwise concluded, the primary investigator will remove the survey and any related data from SurveyMonkey®. Participation in this survey is voluntary, and you can choose not to participate at any time by exiting the browser.

We thank you for participating in this study and helping inform MSF for pharmacists. For any questions related to the MSF questionnaire please contact the student investigator Jeff Herbert at jdjh136@usask.ca.

These questions utilize a five-point Likert scale to rate your agreement with the following statements, a free-text comment box to support ratings, and an option for “unable to assess”

* 1. I place the best interests of the patient as a principal priority

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 2. I engage patients in shared decision making

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 3. I respect patients' informed choices regarding healthcare decisions even if they conflict with my own

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 4. I demonstrate respect and am non-judgmental of patients and co-workers regardless of gender, sexual orientation, ethnicity, or medical condition/disability

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 5. I keep my knowledge and skills up to date

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 6. I respect professional boundaries

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 7. I maintain the confidentiality of information

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 8. I identify and resolve drug therapy problems as a priority

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 9. I identify and resolve drug therapy problems in a timely and efficient manner

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 10. I make recommendations that are evidence-informed

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 11. I accept responsibility for my professional recommendations and actions

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 12. I assume responsibility for monitoring patient's response to therapy

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 13. I verbally communicate my recommendations to both patients and colleagues in a clear and concise manner

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 14. My written documentation facilitates collaboration and continuity of care (accurate, concise, and timely)

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 15. I establish and maintain positive relationships with others to support collaborative care

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 16. I effectively manage conflict within the team

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 17. I manage my stress effectively in the workplace

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 18. OVERALL, how confident am I with medication and medication-use expertise?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 19. How long did it take you to complete this self-assessment (minutes)?

Demographic information

The next questions are multiple-choice questions or free-text answers to capture demographic information

* 20. Number of years as a practicing pharmacist

- <5
- 6-10
- 11-15
- 16-20
- >20

* 21. Credentials (select all that apply)

- BSP
- BSPharm
- PharmD (first degree)
- Msc.
- Ph.D
- PharmD (post-baccalaureate)
- ACPR

* 22. Primary practice area

- Urban (Saskatoon, Regina, Prince Albert)
- Rural

* 23. Name

Appendix I: MSF rater assessment and post-MSF questionnaire (delivered via SurveyMonkey™)

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: MSF rater assessment and post-MSF questionnaire

Consent and MSF program description



UNIVERSITY OF SASKATCHEWAN
College of Pharmacy
and Nutrition
PHARMACY-NUTRITION.USASK.CA

 www.pharmacy-nutrition.usask.ca

Rater consent and MSF program description

You are invited to participate in a research study entitled: *Pilot project of a multi-source feedback process for hospital pharmacists in Saskatchewan*

Objective and Impact of the Research:

- **Objective:** To establish the validity and reliability of a multi-source feedback (MSF) process and to assess its feasibility and acceptability.
- **Purpose:** Ultimately the results of this study can help to inform future MSF programs for hospital pharmacists in a way that can enhance their competency while also being feasible and acceptable.
- **Potential benefits:** Pilot testing and gathering feedback from peer and non-peer raters about the feasibility and acceptability of the MSF process will allow us to improve the process for potential future use by regulatory bodies.


Information and Consent:

- **Researchers:**

Jeff Herbert MSc Student

College of Pharmacy & Nutrition, University of Saskatchewan

Jeff.Herbert@usask.ca

 306-966-6327
 pharmacy-nutrition@usask.ca



Dr. Yvonne Shevchuk

Professor Emerita, College of Pharmacy & Nutrition, University of Saskatchewan

Yvonne.shevchuk@usask.ca

Procedures:

- Electronic questionnaire
 - You are invited to assess your pharmacist colleague using the MSF questionnaire, delivered via SurveyMonkey, while also recording how long it took you to complete the questionnaire.
 - After assessing your pharmacist colleague, you will be asked to complete a post-MSF process survey to gather your thoughts on the validity, reliability, feasibility, and acceptability of the MSF process you have just completed.

Note: It is advisable to complete the MSF questionnaire on a computer as opposed to a mobile device to ensure the reliability of the responses.

Potential Risks:

- There are no foreseeable physical, social, or legal risks to participants. The only possible risk would be psychological or emotional based on the sensitive topic and sometimes the personal nature of competency assessment and feedback, where survey questions or responses could lead to respondents feeling stressed or upset. All information from you will be collected anonymously. Although your



pharmacist colleague has provided your name, there is no way of knowing whether you completed the questionnaire or to enable the pharmacist to determine who provided specific ratings or comments.

- Due to the MSF questionnaire containing an option for open-ended comments it may be possible for the pharmacist to identify you from your responses to these open-ended comments. If less than three of your pharmacist colleagues peer or non-peer raters complete the MSF questionnaire and rate your pharmacist colleague, your data will be excluded from the study.
- Your decision to participate or not will not affect your employment, academic standing, or how you will be treated.

Confidentiality:

- The data collected will be shared in a thesis manuscript as well as potentially journal publications or poster presentations. Peer and non-peer raters information will be anonymous. Survey responses will be presented in aggregate, which will also help to preserve anonymity, and any quotations will be under a pseudonym.
- This questionnaire is hosted by SurveyMonkey®. SurveyMonkey® is a leading website survey platform that promises best-practice data security protocols and storage and adheres to transparent privacy regulations. All questionnaire information will be collected, retained and hosted on a third party server and not on a U of S server. Your data will be stored in facilities hosted in Canada. Your



information is subject to SurveyMonkey's Privacy Policy. Please see the following for more information on SurveyMonkey's privacy policy: <https://www.surveymonkey.com/mp/legal/privacy/>. As soon as a survey is complete or otherwise concluded, the primary investigator will remove the survey and any related data from SurveyMonkey.

- Under exceptional circumstances, the Chair of the Behavioural Research Ethics board or their designate may need to review your responses to check whether the information collected for the study is correct and to ensure that the study followed the required laws and guidelines.

Storage of Data:

- Electronic data will be stored on a password-protected computer during analysis but will be moved to a University of Saskatchewan DATASTORE® folder for long-term storage.
- Data will be stored for five years post-publication. After the storage period and when data is no longer required it will be destroyed beyond recovery.
- The primary investigator (Dr.Y Shevchuk) will be responsible for the security and storage of the de-identified data

Right to Withdraw:



- Participation in this survey is voluntary.
- Once you have submitted your data it will be unable to be withdrawn due to its anonymity.

Compensation:

- No compensation is offered for this project.

Questions or Concerns:

- Contact the researcher(s) using the following information:
 - Email: Jdh136@usask.ca
 - Email: yvonne.shevchuk@usask.ca
- This research project has been approved on ethical grounds by the University of Saskatchewan Behavioural Research Ethics Board (ID 4342). Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office: ethics.office@usask.ca; 306-966-2975; out-of-town participants may call toll-free 1-888-966-2975.

By completing and submitting this questionnaire, your free and informed consent is implied and indicates that you understand the above conditions of participation in this study.

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: MSF rater assessment and post-MSF questionnaire

Introduction

Thank you for participating in our pilot project of a multi-source feedback (MSF) questionnaire for hospital pharmacists in Saskatchewan as a peer/non-peer rater. Please read the following information.

Questionnaire Instructions:

There are 18 statements to complete assessing various competencies for the pharmacist who has invited you to participate. Please rate your agreement with the following statements. After each question, there is a free-text box to leave comments explaining the rationale for your rating. We strongly encourage you to leave comments as this will provide the most meaningful feedback that the pharmacist can use to identify and reflect on areas of strength and improvement. Even though you may feel strongly the person you are assessing is an exceptional pharmacist, there is always room for improvement. Your feedback will allow your peer an opportunity to focus on areas of improvement. The only demographic information required is whom you are rating, your occupation, and the number of months or years you have known the pharmacist being assessed. Your identity will not be revealed to the pharmacist you are assessing. The information you provide is anonymous except for the student investigator (Jeff Herbert). You will be de-identified in any information provided to the research committee and the final manuscript.

The MSF questionnaire should take approximately fifteen to twenty minutes to complete. There will be a question on the total amount of time it took you to complete the assessment so please keep track of when you started and completed the assessment. After the completion of the MSF questionnaire, you'll have the opportunity to provide feedback on the MSF process which should take an additional ten to fifteen minutes.

As soon as a survey is complete or otherwise concluded, the primary investigator will remove the survey and any related data from SurveyMonkey®. Participation in this survey is voluntary, and you can choose not to participate at any time by exiting the browser.

We thank you for participating in this study and helping inform MSF for pharmacists. For any questions related to the MSF questionnaire please contact the student investigator Jeff Herbert at jdh136@usask.ca.

These questions utilize a five-point Likert scale to rate your agreement with the following statements, a free-text comment box to support ratings, and an option for “unable to assess”

* 1. This pharmacist places the best interests of the patient as a principal priority

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 2. This pharmacist engages patients in shared decision making

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 3. This pharmacist respects patients' informed choices regarding healthcare decisions even if these conflict with their own

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 4. This pharmacist demonstrates respect and is non-judgmental of patients and co-workers regardless of gender, sexual orientation, ethnicity, or medical condition/disability

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 5. This pharmacist keeps their knowledge and skills up to date

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 6. This pharmacist respects professional boundaries

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 7. This pharmacist maintains confidentiality of information

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 8. This pharmacist identifies and resolves drug therapy problems as a priority

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 9. This pharmacist identifies and resolves drug therapy problems in a timely and efficient manner

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 10. This pharmacist makes recommendations that are evidence-informed

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 11. This pharmacist accepts responsibility for their professional recommendations and actions

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 12. This pharmacist assumes responsibility for monitoring patient's response to therapy

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 13. This pharmacist verbally communicates their recommendations to both patients and colleagues in a clear and concise manner

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 14. This pharmacist's written documentation facilitates collaboration and continuity of care (accurate, concise, and timely)

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 15. This pharmacist establishes and maintains positive relationships with others to support collaborative care

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 16. This pharmacist effectively manages conflict within the team

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 17. This pharmacist appears to manage their stress effectively in the workplace.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 18. OVERALL, how confident are you in this pharmacist's medication and medication-use expertise?

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree
- Unable to assess

Comment to support rating

* 19. How long did it take you to rate your pharmacist colleague (minutes)?

Demographic information

The next questions are multiple-choice questions or free-text answers to capture demographic information

* 20. Provide the name of the pharmacist you are assessing

* 21. What is your occupation?

- Dietitian
- Nurse
- Nurse practitioner
- Occupational therapist
- Pharmacist
- Pharmacy technician
- Physical therapist
- Physician
- Social Worker
- Other (please specify)

22. Have you previously rated a pharmacist in this study?

- Yes
- No

Post MSF-process survey

The following questions utilize a five-point Likert scale to rate your agreement with the following statements

23. Please rate how useful this multi-source feedback is in assessing professionalism for your pharmacist colleague

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

24. Please rate how useful this multi-source feedback is in assessing collaboration for your pharmacist colleague

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

25. Please rate how useful this multi-source feedback is in assessing communication for your pharmacist colleague

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

26. The amount of time I spent completing the MSF process was considered burdensome

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Post MSF-process survey

27. The MSF process was clear and easy to complete

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

28. What was unclear or difficult about the MSF process?

Post MSF-process survey

29. The process used to recruit me as a rater was simple and easy

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

30. What could be used to improve the rater recruitment process?

Post MSF-process survey

31. The number of questions in the MSF questionnaire was appropriate

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

32. What would be an appropriate number of questions?

Post MSF-process survey

33. I would recommend the completion of the MSF process to a pharmacist colleague

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

34. Why would you recommend or not recommend the MSF process?

Post MSF-process survey

35. I would be willing to repeat the MSF process every five years for my pharmacist colleague

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

36. I believe the MSF questionnaire is an important activity for the development of my pharmacist colleagues' communication, collaboration, and professionalism.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

37. I expect the professional performance of my pharmacist colleague to improve as a result of the MSF process

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: MSF rater assessment and post-MSF questionnaire

Post MSF-process survey

38. Considering the whole MSF process that you have participated in (from recruitment to rating your pharmacist colleague), how would you rate the process? The question below uses a 7-point scale with two opposite adjectives, where a 7 represents the positive adjective and 1 represents the negative adjective

	1	2	3	4	5	6	7
Unfeasible <-> Feasible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unacceptable <-> Acceptable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unfair <-> Fair	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Negative <-> Positive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not valid <-> Valid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unreliable <-> Reliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Post-MSF process survey

39. Were any of the MSF questions unclear, poorly worded, or unnecessary? Specify which one(s)

40. Do you have any additional comments on this MSF process (positive or negative) or any suggestions for improvement?

Appendix J: Post-MSF process questionnaire for ratees (delivered via SurveyMonkey™)

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: Post-MSF process questionnaire for ratee's

Consent



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You are invited to participate in a research study entitled: *Pilot project of a multi-source feedback process for hospital pharmacists in Saskatchewan – post MSF survey.*

As a reminder here are the purpose and objectives of the study which are the same as the original consent form. This portion of consent is related to the post MSF-process survey.

Objective and Impact of the Research:

- **Objective:** To establish the validity and reliability of a multi-source feedback (MSF) process and to assess its feasibility and acceptability.
- **Purpose:** Ultimately the results of this study can help to inform future MSF programs for hospital pharmacists in a way that can enhance their competency while also being feasible and acceptable.
- **Potential benefits:** Pilot testing and gathering feedback from peer and non-peer raters about the feasibility and acceptability of the MSF process will allow us to improve the process for potential future use by regulatory bodies.

Information and Consent:

· Researchers:

Jeff Herbert MSc Student

College of Pharmacy & Nutrition, University of Saskatchewan

Jeff.Herbert@usask.ca

306-966-6327
 pharmacy-nutrition@usask.ca



Dr. Yvonne Shevchuk

Professor Emerita, College of Pharmacy & Nutrition, University of Saskatchewan

Yvonne.shevchuk@usask.ca

Procedures:

Electronic questionnaire

- o You are invited to complete a post-MSF process survey to gather your thoughts on the validity, reliability, feasibility, and acceptability of the MSF process you have just completed.

Note: It is advisable to complete the post MSF-process survey on a computer as opposed to a mobile device to ensure the reliability of the responses.

Potential Risks:

There are no foreseeable physical, social, or legal risks to participants. The only possible risk would be psychological or emotional based on the sensitive topic and sometimes the personal nature of competency assessment and feedback, where survey questions or responses could lead to respondents feeling stressed or upset. All information from you will be collected anonymously.



Some questions in the post MSF-process survey contain an option for open-ended comments. It may be possible for the student and primary investigator to identify you from your response to these comments.

Your decision to participate or not will not affect your employment, academic standing, or how you will be treated.

Confidentiality:

The data collected will be shared in a thesis manuscript as well as potentially



Some questions in the post MSF-process survey contain an option for open-ended comments. It may be possible for the student and primary investigator to identify you from your response to these comments.

Your decision to participate or not will not affect your employment, academic standing, or how you will be treated.

Confidentiality:

The data collected will be shared in a thesis manuscript as well as potentially journal publications or poster presentations. Peer and non-peer raters information will be anonymous. Survey responses will be presented in aggregate, which will also help to preserve anonymity, and any quotations will be under a pseudonym. This questionnaire is hosted by SurveyMonkeyS. SurveyMonkeyfi is a leading website survey platform that promises best-practice data security protocols and storage and adheres to transparent privacy regulations. All questionnaire information will be collected, retained and hosted on a third party server and not on a U of S server. Your data will be stored in facilities hosted in Canada. Your information is subject to SurveyMonkey's Privacy Policy. Please see the following for more information on SurveyMonkey's privacy policy: <https://www.surveymonkey.com/mp/legal/privacy/>. As soon as a survey is complete or otherwise concluded, the primary investigator will remove the survey and any related data from SurveyMonkey.



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Under exceptional circumstances, the Chair of the Behavioural Research Ethics board or their designate may need to review your responses to check whether the information collected for the study is correct and to ensure that the study followed the required laws and guidelines.

Storage of Data:

Electronic data will be stored on a password-protected computer during analysis but will be moved to a University of Saskatchewan DATASTO OR folder for long-term storage.

Data will be stored for five years post-publication. After the storage period and when data is no longer required it will be destroyed beyond recovery.

The primary investigator (Dr.Y Shevchuk) will be responsible for the security and storage of the de-identified data

Right to Withdrawn

Participation in this survey is voluntary.

Once you have submitted your data it will be unable to be withdrawn due to its anonymity.

Compensation:



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No compensation is offered for this project

Questions or Concerns:

Contact the researcher(s) using the following information:

- o Email: Jdhl36@usask.ca
- o Email: _vonnc.she_clv_til@usask.ca

This research project has been approved on ethical grounds by the University of Saskatchewan Behavioural Research Ethics Board (1D 4342). Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office: ethics.office@usask.ca; 306-966-2975; out-of-town participants may call toll-free 1-888-966-2975.

By completing and submitting this questionnaire, your free and informed consent is implied and indicates that you understand the above conditions of participation in this study.

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: Post-MSF process questionnaire for ratee's

Introduction

Thank you for participating in and completing our pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan as a ratee. Please read the following information below.

Questionnaire Instructions:

There are 23 statements to complete regarding your feedback for the MSF process including recruitment of peer and non-peer raters. Participation in this survey is voluntary, and you can choose not to participate at any time by exiting the browser.

We thank you for participating in this study and helping inform MSF for pharmacists. For any questions related to the MSF questionnaire please contact the student investigator Jeff Herbert at jdh136@usask.ca.

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: Post-MSF process questionnaire for ratee's

Post MSF-process survey

The following questions utilize a five-point Likert scale to rate your agreement with the following statements

*** 1. Please rate how useful this multi-source feedback is in assessing your professionalism**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

*** 2. Please rate how useful this multi-source feedback is in assessing your ability to collaborate**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

*** 3. Please rate how useful this multi-source feedback is in assessing your communication**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

*** 4. The amount of time I spent completing the MSF process was considered burdensome**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: Post-MSF process questionnaire for ratee's

Post MSF-process survey

*** 5. The MSF process was clear and easy to complete**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: Post-MSF process questionnaire for ratee's

Post-MSF process survey

*** 6. What was unclear or difficult about the MSF process?**

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: Post-MSF process questionnaire for ratee's

Post MSF-process survey

*** 7. The process used to recruit raters was simple and easy**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: Post-MSF process questionnaire for ratee's

Post MSF-process survey

*** 8. How could the recruitment process be improved?**

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: Post-MSF process questionnaire for ratee's

Post MSF-process survey

*** 9. The number of raters (peer and non-peer) to recruit was appropriate**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: Post-MSF process questionnaire for ratee's

Post MSF-process survey

*** 10. What would be an appropriate number of raters?**

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: Post-MSF process questionnaire for ratee's

Post MSF-process survey

*** 11. The number of questions in the MSF questionnaire was appropriate**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: Post-MSF process questionnaire for ratee's

Post MSF-process survey

*** 12. What would be an appropriate number of questions?**

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: Post-MSF process questionnaire for ratee's

Post MSF-process survey

*** 13. I would recommend the completion of the MSF process to a colleague**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: Post-MSF process questionnaire for ratee's

Post MSF-process survey

*** 14. Why would you recommend or not recommend the MSF process?**

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: Post-MSF process questionnaire for ratee's

Post MSF-process survey

*** 15. I would be willing to repeat the MSF process every five years for my pharmacist colleague**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

*** 16. I believe the MSF questionnaire is an important activity for the development of my communication, collaboration, and professionalism.**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

*** 17. I expect my professional performance to improve as a result of the MSF process**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

*** 18. The feedback I have received through the MSF process has increased my awareness and ability to self-assess**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: Post-MSF process questionnaire for ratee's

Post MSF-process survey

*** 19. Considering the whole MSF process that you have participated in (from self-assessment and recruitment of raters to reviewing the collated report), how would you rate the process? The question below uses a 7-point scale with two opposite adjectives, where a 7 represents the positive adjective and 1 represents a negative adjective.**

	1	2	3	4	5	6	7
Unfeasible <-> Feasible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unacceptable <-> Acceptable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unfair <-> Fair	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Negative <-> Positive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not valid <-> Valid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unreliable <-> Reliable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Pilot project of a multi-source feedback (MSF) process for hospital pharmacists in Saskatchewan: Post-MSF process questionnaire for ratee's

Post-MSF process survey

*** 20. Were any of the MSF questions unclear, poorly worded, or unnecessary? Specify which one(s)**

*** 21. Do you have any additional comments on this MSF process (positive or negative) or any suggestions for improvement?**

Appendix K: Structured tabular thematic analysis

Steps:

1. A-priori theme development:
 - Four themes were chosen based on pre-existing pharmacy MSF studies (positive, negative, not applicable and suggestions for improvement)
2. Data immersion and tabulation of themes
 - The student investigator entered each open-ended answer into a Microsoft Excel® with pre-specified themes in separate columns.
 - The primary investigator and student investigator then reviewed the open-ended responses.
 - Each open-ended response was assigned to a theme by adding a X in the relevant column.
 - Open-ended answers that contained more than one pre-specified theme could have an X in each relevant column. For data analysis purposes this would count as two separate statements.
3. Checking inter-analyst agreement
 - The student investigator then combined both excel spreadsheets, noting any disagreements.
 - The total number of disagreements and agreements was then calculated.
Total number of agreements / total number of agreements + disagreements x 100
 - In the event of any disagreement in the theming of responses, a third member would be the deciding vote (advisory committee member - Shauna Gerwing)
4. Exploring theme frequencies
 - The frequency of open-ended responses to each theme was calculated by the student investigator.

Appendix L Post MSF-process survey open-text responses

Post MSF-process survey for raters (peer and non-peer) (N=94)	
Peer responses (N=40)	
Question	Open-text comments
What was unclear or difficult about the MSF process?	<ol style="list-style-type: none"> 1. My pharmacy colleagues are very independent and I don't observe their interactions with other people. Also Participant is a new pharmacist and I don't have enough interaction with her to add constructive feedback.
What could be used to improve the rater recruitment process?	N/A
What would be an appropriate number of questions?	<ol style="list-style-type: none"> 1. 10 (peer) 2. 10 (peer) 3. We don't need this many questions to rate. (peer) 4. I personally don't think the number of questions is as important as the quality and type of questions. These are not questions I would have expected for a competency assessment as it does not allow for a full review of one's quality of work. Especially if you don't work side by side with the ratee everyday, it's quite hard to assess how they communicate with their patients, etc. (peer)

Why would you recommend or not recommend the MSF process?

1. The MSF can introduce biases and inconsistencies due to varied perceptions and expectations from different evaluators. This diversity in feedback sources may lead to conflicting assessments, making it challenging to derive a clear, actionable understanding of the pharmacist's performance. Or if it is all just good and positive feedback, then was it value added and worth the time. Additionally, the process can be time-consuming and administratively burdensome, potentially detracting from the focus on direct patient care and pharmacy operations. It may also create stress for the pharmacist being evaluated, impacting their performance and well-being. If we want to talk about conflict or stress related situations, I would say asking a colleague to evaluate is one of them, especially a non-pharmacy related one.
2. I think it could be useful, but there's too many questions and it feels like some are repetitive.
3. Seems reasonable
4. -Ultimately would recommend the MSF process. I thought there were an appropriate number of questions to assess the pharmacist (re professionalism, collaboration, communication) and receiving feedback from numerous sources with whom you work with on a day-to-day basis would be very useful and provide a more well-rounded assessment. Performing the survey electronically was convenient. - A perceived barrier I see is the written feedback component. Although

likely most valuable, I personally found the written feedback piece to be most time-consuming, especially when working on a busy ward. I suspect this could limit survey uptake or at least limit documentation of valuable comments from those who complete the assessment.

5. Questions are vague. I could not give honest feedback because I don't know how the information will be delivered. Simply compiling the results of constructive feedback would harm the assessed pharmacists feelings and create difficult team dynamics. The feedback should be given in-person with explicit examples.
6. Would like to learn more about the outcomes/see the outcomes before I recommend anything.
7. Questions were very broad
8. Asking one colleague to assess yourself is one thing, but if everyone is requiring feedback from everyone then it becomes the responsibility of 1 individual to then provide feedback for 4-5 colleagues which can be come burdensome.
9. I do not believe it accurately captures competencies for pharmacists, especially in a smaller hospital setting. The majority of the questions led to the response of 'unable to assess' since we often are not working with other pharmacists in many of our clinical roles.
10. It could be a beneficial tool however it is challenging in a busy, sometimes short staffed environment to fully observe some of the

activities for valuable feedback/being able to provide direct examples as cannot follow the pharmacist to complete a lot of activities.

11. I would not recommend as the MSF process is at risk for cherry-picking colleagues with the best relationship with the reviewees. The best way to assess clinical pharmacist skills would be to create an OSCE to standardize evaluation of pharmacist skills.
12. Valuable for pharmacists to receive feedback to improve/expand practice
13. Completely subjective, you could just ask people who know will give you a good rating, which completely skews the accuracy and point of the whole process
14. I would not recommend the MSF process as I feel the answers are very biased. Please will ask friends to complete this survey for them rather than someone who would have a more objective point of view.
15. time consuming process and overall a likert scale type survey lacks enough detail to comment on the nuance that exists in areas such as communication, patient care, etc. without extremely detailed commentary which makes it challenging to allow for actionable feedback. If detailed commentary is present then it makes feedback even more time consuming and likert scale redundant
16. yes if there is dedicated time provided to complete the MSF survey and go over results

17. Provides an opportunity for staff to receive feedback on their skills and process in a non-threatening manner.
18. I would recommend as it is a tool to assess yourself and work to improve as a professional
19. The questions were redundant
20. Always good to get feed back from colleagues on how you are doing. There is always room to grow in the profession and maybe this is the boost or kick In the pants an individual needs to gain future success and fulfillment with their job.
21. I don't think this is a fair assessment of one's competency. it is also open to a lot of bias as I'd imagine most people will ask pharmacists within a closer circle to them for evaluation (potential for less honest feedback), but also the questions don't consider that most pharmacists work alone and don't have someone witnessing their interactions on the ward with patients and other team members, as well as their other interventions throughout the day.
22. quick and comprehensive
23. I think a face to face process would be more beneficial if both parties are comfortable with each other
24. The post-MSF questions was quite a long process
25. Direct feedback doesn't happen often for pharmacists. This gives a general temperature gauge of how one is doing.

Were any of the MSF questions unclear, poorly worded, or unnecessary? Specify which one(s)

1. No, very clear and straightforward
2. I think the question about professional boundaries could be clarified a bit or some examples provided. Question 11 seems redundant. Question 8 and 9 also seem similar.
3. There was a question about respect and something else in regards to different backgrounds. The 7 point scale questions did not make any sense
4. I found them very broad
5. There is a lot of subjective interpretation on this questionnaire.
6. I think the MSF questions could be written to be more specific, with criteria to assist with choosing the assessment scores
7. Not sure the question about confidentiality was necessary. If a colleague was breaking confidentiality it should be discussed with them and reported if necessary.
8. A lot of the questions were assessing the same things
9. I found most of the questions to be an unreliable assessment of a colleague.
10. No
11. No
12. The questions worded as "Please rate how useful this multi-source feedback is in assessing" should be "very useful, useful, neutral, not useful, really not useful" instead of strongly agree etc... Please rate then

	the choices are strongly agree doesn't seem to flow.
Do you have any additional comments on this MSF process (positive or negative) or any suggestions for improvement	<ol style="list-style-type: none"> 1. Better describe the blinding of the assessments better describe how the material is looped back to the person 2. I think it might be hard to recruit colleagues in smaller departments 3. Perhaps as the last question asked "How" confident we were.. it would be rated on a scale/ used words such as very, not at all etc to answer that question. 4. as per previous answer difficult to fully evaluate with examples and feedback as not able to observe all activities pharmacist completes. 5. I feel this process could be used only in conjunction with an OSCE to actually assess pharmacist therapeutic skills. 6. There should be a way to give feedback on the process without having to complete the survey for someone There is a big possibility that the survey would not be anonymous. Example: you ask 6 people and only 2 complete the survey. It is quite likely you could discern who said what based on the comments. This can make others hesitant to participate if they were asked to assess someone who is not doing well (ie would not be as honest due to fear of not being anonymous) 7. I think that to implement the MSF process for licensure, would likely cost a lot, with little gain at assessing competency. 8. Suggest to have a field to specifically ask for recommendations for

	<p>improvement. Utility of MSF survey results heavily rely on comments, but it is difficult to think of spI feel like this is a recipe for conflict in departments if anyone is rated poorly. I don't mean for this specific colleague, but in general specific examples on the spot when filling out the survey</p> <p>9. I feel like this is a recipe for conflict in departments if anyone is rated poorly. I don't mean for this specific colleague, but in general</p> <p>10. As a manager, completing one form is not at all burdensome. If all of my staff approached me to do this time would be an issue (60 FTEs)</p> <p>11. Fewer question</p> <p>12. I don't find this process to be a fair or reasonable assessment of a colleague. I also don't feel that we should be assessing our colleagues as this should be done objectively from a person who can actually offer constructive criticism/advice.</p> <p>13. No</p> <p>14. consideration for how to provide constructive feedback - the ability to comment on each question is helpful, however it can lose context. This is not easy - overall, i think that there is value in a quick MSF as part of a larger assessment/evaluation process</p>
Non-peer responses (N=54)	

<p>What was unclear or difficult about the MSF process?</p>	<p>1. Some of the questions were not easy to elaborate on,</p>
<p>What could be used to improve the rater recruitment process?</p>	<p>N/A</p>
<p>What would be an appropriate number of questions?</p>	<p>N/A</p>
<p>Why would you recommend or not recommend the MSF process?</p>	<ol style="list-style-type: none"> 1. Relatively quick, easy to fill out 2. It was easy to complete and didn't take much time 3. Receiving feedback from colleagues is essential for our growth as professionals. We are more likely to receive feedback from individuals from our own profession, but it is beneficial to receive feedback also from other disciplines. 4. Professional feedback is essential for growth and improvement 5. Can't comment. Would say that requiring more than 5 assessments could be burdensome for the pharmacist being evaluated 6. I think it would be very informative to experience getting feedback from the MSF process. I would like to know what others see as my personal strengths and weaknesses, and so I assume my professional colleagues likely feel similarly and would also benefit from the

feedback received. It would be especially interesting to see feedback from beyond one's own profession, to better understand one's strengths and weaknesses from an interprofessional collaborative point of view.

7. not sure of the intended outcome.
8. Hopefully the results will be fed back to the pharmacists!
9. As a professional, we should be able and willing to have a discussion in order to resolve concerns or issues.
10. I wouldn't recommend the MSF process. I feel it should be up to the employer to assess their staff in a manner that suits their needs. Also what does this survey really do for the individual?
11. Participant respectfully asked me to participate, sent me the link, and ensured follow-up. It was an easy to use survey, and it actually allowed me a good opportunity to reflect on the various important aspects that make for excellent clinical practice. It gives me a framework for understanding WHY it is that I feel someone is an excellent colleague, and WHAT it takes to be an excellent colleague. Thanks!
12. We do something similar as physicians. It was very useful for me. I don't know how useful it is for pharmacists.
13. i think feedback is important.
14. It was easy to use
15. Recommend
16. Excellent professional development tool for health care provider.

17. I prefer to give feedback in person or over the phone
18. Hospital pharmacy technicians do not follow the patient from admission to discharge - so it is difficult to assess the skills of the pharmacist when there is no patient interaction.
19. It is easy and appropriate
20. It is an easy and effective way to rate the Pharmacist
21. I would recommend as this process was quick, easy and covered all areas
22. Easy and quick to complete
23. There are very extensive instructions and the process is quite long. I am not sure the level of general engagement you will get. You will simply get a bias of people who are rating really good colleagues who want to help them. Or really bad colleagues and want to red flag them. And are willing to spend the time to do that. For the mediocre or medium pharmacists you will likely have very very generic click throughs.
24. Quick and easy
25. Easy to use, not a large time commitment, easy to complete
26. Sometimes the questions could be asked differently. It hard to scale it from 1-5
27. I don't have any reason to do either, but would not dissuade a colleague from completing it.
28. it was easy

	<p>29. Ensuring that our pharmacists are good at their job and giving patients accurate information.</p>
<p>Were any of the MSF questions unclear, poorly worded, or unnecessary? Specify which one(s)</p>	<ol style="list-style-type: none"> 1. n/a 2. None 3. No 4. No 5. Some of the post-MSF survey questions seem unnecessary. As a participant it is really not my domain to assess if your metric is valid or reliable, I would assume that is something you have demonstrated prior to selecting this measurement tool. 6. I can't remember the wording, but I can't comment on how useful this is for the pharmacist. 7. None 8. No 9. Clinical work environment may make some questions unable to be answered. 10. No 11. No 12. No 13. No 14. No

	<p>15. None noted. It was clear</p> <p>16. I wish there was some examples of how they were more supportive to the patient or colleagues. Like filling out EDS for patient so discharges go well or how are ways they dealt with a difficult staff member with a tick box options. Maybe ask questions that maybe impacted their work flow. sometimes I don't think its the pharmacists issue it could be the collaboration of the professional team. If they are waiting for orders from the doctor or working with a difficult patient. What are some things that make them not be able to do their job well.</p> <p>17. Two of the questions seemed a bit repetitive. I don't recall exactly which.</p> <p>18. No</p> <p>19. None</p> <p>20. None</p>
<p>Do you have any additional comments on this MSF process (positive or negative) or any suggestions for improvement</p>	<p>1. n/a</p> <p>2. No</p> <p>3. No</p> <p>4. Easy to use, quick and simple. Love working closely with participant in the hospital and was happy to fill this out in regards to her. She always is happy, approachable and explains things well.</p> <p>5. I find a comment of "Keep doing" and "Stop doing. .. " is helpful</p>

way to change practice. Most of the questions were aimed at competency, rather than professionalism. It would be hard to change practice based on simply ratings.

6. The rating of the process itself was the most burdensome part of this survey.
7. There could be less post-process survey questions. I am more than happy to take the time to assess and discuss the excellent work of my esteemed colleague, but I feel like I spent just as much time answering questions about how important/useful the assessment/process was than I did actually evaluating my colleague. Participant is excellent, the post-process survey could be streamlined. Thanks!
8. This post process survey is VERY long.
9. why is the process reviewing the staff member less than the process reviewing the reviewing process
10. No
11. Need a question about educational role performed by Pharmacist (related to teaching pharmacy learners or other healthcare professionals)
12. No
13. None
14. No
15. No

	<p>16. This needs to be shorter. The survey is also very long. The intro page was way too long.</p> <p>17. No</p> <p>18. No thank you</p> <p>19. It is also hard for pharmacists to be at their best when the resources are not there. When we are short staffed.</p> <p>20. Initial survey fine. I cannot comment on whether I think this process improves performance as I did not particularly see a deficit to begin with regarding this particular pharmacist- perhaps with alternate pharmacy colleagues it may be more relevant. I could see the role of the evaluator being more or less relevant in the extent that they understand the nuances of a pharmacist's capacity and expertise- farbeit for any other role to be overly critical of therapeutics, though feedback regarding communication and collaboration would be more universal. No negative commentary regarding this process, thanks.</p> <p>21. No</p> <p>22. No</p>
<p>Post MSF-process survey for ratees (N=9)</p>	
<p>Question</p>	<p>Open-text comments</p>

<p>What was unclear or difficult about the MSF process</p>	<p>N/A</p>
<p>How could the recruitment process be improved?</p>	<ol style="list-style-type: none"> 1. By explaining expectations better to raters, OR by having more questions that were most specific. The hardest part about recruitment was raters saying that they didn't know what was expected of them in providing feedback, or didn't feel comfortable providing feedback. If what was wanted was more clear, they might be more likely to fill it out. 2. Hard to get 8 peer reviewers when working in rural locations. No reminders sent out to reviewers so originally read then lost in emails 3. The number of raters requested by the study makes it difficult for individuals, especially for new graduates that have just started within a work environment to find enough people as well as people who are appropriate and willing to complete the evaluation
<p>What would be an appropriate number of raters?</p>	<ol style="list-style-type: none"> 1. 4 2. Maximum 3 3. Depending on if you included community and hospital pharmacist. Hard to get 8 pharmacist reviewers when you only work with 3 others and some places only work with 1 if any pharmacists
<p>What would be an appropriate number of questions?</p>	<ol style="list-style-type: none"> 1. 10 or less

	<ol style="list-style-type: none"> 2. More than what was included, as mentioned previously, but more directed questions.
<p>Why would you recommend or not recommend the MSF process?</p>	<ol style="list-style-type: none"> 1. I wouldn't recommend it currently, as the way the selection process is for your raters seems incredibly biased, (close friendships with rater, choosing raters that you know will say positive things) and may lead to not receiving any actionable feedback 2. I would not recommend this process to a colleague because it was time consuming to find enough people to complete the survey. I did not find it helpful on how to facilitate change in my current practice. I also do not understand how a subjective rating scale such as a survey is supposed to measure an objective outcome such as competency as a pharmacist, as such this can be influenced both positively and negatively by the way raters complete their questionnaire.
<p>Were any of the MSF questions unclear, poorly worded, or unnecessary? Specify which one(s)</p>	<ol style="list-style-type: none"> 1. No 2. All questions worded well 3. None were unnecessary. If anything, more questions would have been more valuable 4. N/A 5. Nope, no issues with the questions

	<p>6. Question 18: “OVERALL, how confident are you in this pharmacist’s medication and medication-use expertise?” I found the answer scale not applicable to this question</p> <p>7. None</p> <p>8. None.</p> <p>9. None that come to mind</p>
<p>Do you have any additional comments on this MSF process (positive or negative) or any suggestions for improvement?</p>	<ol style="list-style-type: none"> 1. do not have a minimum number of raters in order for RX to see their feedback. Missed out on seeing some feedback as i didn't have enough peer raters (I know this was an ethics situation) 2. -Overall found this to be helpful way to see how your interprofessional team/colleagues view you as a pharmacist - Found the comments to be the most valuable when reviewing my results, but do think the number of questions and associated comments within the survey limited meaningful responses by the raters. 3. Raters gave feedback that they were hesitant to participate as they were unsure of the quality of their feedback and uncomfortable with their own skills in providing feedback. Having more direct questions WITH room for free text or prompting for an example (as the free text is most valuable) would be beneficial. I feel overall this is a necessary, beneficial exercise in self reflection and creating actionable plans. I found it quite easy to review the feedback and create SMART goals,

but I have lots of experience doing this. Someone else may require more guidance or may have increased levels of discomfort. Overall, this process was a good way to compare my self ratings with others, and reflect upon why they were different. Having more written feedback would be useful, but there needs to be skill development and a more clear expectation for raters in order for this to occur.

4. N/A
5. It was easy to identify the responses in the report. One idea is to have a bar graph with the highest and lowest number and an average so you cannot distinguish who completed what. I think it has the potential to cause conflict with coworkers if someone isnt meeting standards and unaware it. I know from personal experience it would be difficult to honestly rate a coworker when the study size is so small.
6. Feel the MSF process was a valuable opportunity to reflect on one's practice as well as receive feedback from colleagues. Although results were overwhelmingly positive, responses were motivating and lit a fire for self-improvement and to reduce complacency
7. None
8. I do not believe that something such as level of competency which should be measured objectively, that it is adequate with a subjective measuring tool such as a survey. The results, or the level of competency being measured can be easily influenced based on the individuals

	<p>selected to complete the survey which means the results could then be inaccurate or artificial.</p> <p>9. Overall I think the MSF process is a useful process. The biggest issues were the time commitment (takes significant time to answer the questions in depth), and recruitment. While recruiting is viable, it again takes a large amount of time. I think MSF is great, but would need a lot of work on how to implement it smoothly. Considering how short health care is on resources I think if it's not easy to actually complete people will "complete" it, but not actually meaningfully complete it.</p>
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