Report to the
Saskatchewan College of Pharmacy Professionals
Community Pharmacy Professionals Advancing Safety in Saskatchewan Program
(COMPASS)

Analysis of Medication Incidents Associated with Patient Harm in Saskatchewan using the Medication Safety Culture Indicator Matrix (MedSCIM)

2020 Edition

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Un partenaire clé du Système canadien de déclaration et de prévention des incidents médicamenteux

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Background

Several provinces have established initiatives to improve patient safety through engagement in continuous quality improvement. A key component of these initiatives is community pharmacy participation in anonymous medication incident reporting programs coupled with the analysis of medication incidents for the purpose of shared learning.

To promote comprehensive incident reporting, organizations must strive to move from a "blame and shame" culture which emphasizes individual fault, to a culture that focuses on system factors and is generative of solutions that can improve patient safety.[1]

The Community Pharmacy Professionals Advancing Safety in Saskatchewan (COMPASS) program was developed by the Saskatchewan College of Pharmacy Professionals (SCPP) in partnership with the Institute for Safe Medication Practices Canada (ISMP Canada).[2] The COMPASS program consists of three main initiatives: medication incident reporting, proactive safety assessments, and quality improvement meetings. As of December 2017, all community pharmacies in Saskatchewan have been participating in the COMPASS program.[2]

The objective of this analysis was to examine the medication safety culture demonstrated by Saskatchewan community pharmacy professionals using the Medication Safety Culture Indicator Matrix (MedSCIM), and provide a comparison with the previous assessment conducted in 2019.

Methods

Medication incidents from all COMPASS pharmacies are reported to the ISMP Canada Community Pharmacy Incident Reporting (CPhIR) Program.[3] During the incident reporting process, there are mandatory fields that users must include in their reports such as: type of medication incident, medications involved, and a description of the medication incident. The information from these mandatory fields is combined with information from optional fields such as contributing factors and actions at the store level and then used for the purpose of incident analysis and shared learning.

During the reporting period from February 1, 2019 to August 30, 2020, there were incidents that were retroactively reported, dating back to January 2018. During this period, 359 incidents associated with patient harm were reported by COMPASS pharmacies. Thirteen of these incidents were omitted for varying reasons: two incidents were assessed to be "not applicable", nine incidents were concluded to be adverse drug reactions instead of medication incidents, and two incidents were determined to be duplicate reports. Therefore, a total of 346 incidents were included in this analysis.

Analysis of the dataset was performed by two independent analysts using the Medication Safety Culture Indicator Matrix (MedSCIM) tool. The MedSCIM framework allows for the qualitative assessment of an organization's patient safety culture by evaluating narrative information contained in medication incident reports. The medication incidents were then categorized and given an alphanumeric score based on the two dimensions of the MedSCIM tool:[4]

1. **Core Event: Degree of Documentation** evaluates incident reports based on their clarity and completeness. This includes whether readers can understand *what* the medication incident was, and

why the incident may have occurred (i.e., underlying contributing factors). Ratings on the "Core Event" domain can range from 1 to 3 (Table 1).[4]

2. **Maturity of Culture to Medication Safety** evaluates incident reports based on the reporter's perceived approach to patient safety culture. This includes the reporter's ability to view medication incidents from a system-based perspective, rather than one focused on individual fault. Ratings on the "Maturity of Culture to Medication Safety" domain can range from A to D (Table 1).[4]

Results

There was some variation in the degree of documentation present in the reports from COMPASS pharmacies (Figure 1). The majority of the incident reports (271 of 346) were deemed to be "fully complete" (i.e., Level 1), as the details of the medication incident were clear, and potential contributing factors were suggested. Approximately one-fifth of the incidents (71 of 346) were deemed to be "semi-complete" (i.e., Level 2), as their level of documentation allowed for an understanding of what medication incident had occurred. Very few of the incidents (4 of 346) were deemed to be "not complete" (i.e., Level 3). In these cases, details of the medication incident remained unclear.

COMPASS pharmacies also showed some variability in their maturity of culture to medication safety (Figure 2). Nearly two-thirds (*n* = 222) of the analyzed incidents were characterized as having a "generative" (i.e., Grade A) culture. For these incidents, the reporters went beyond simply resolving medication incidents as they occur and offered solutions to identified system flaws with the aim of preventing error recurrence. Fifty-two of the 346 reports fit within the "reactive" (i.e., Grade C) culture. These reports treated incidents as isolated events and did not approach the incidents from a system-based perspective or offer a solution. A "calculative" (i.e., Grade B) culture was identified in 49 of the reported incidents, whereby the reporters considered how the medication system may have allowed the incident to occur but did not advance remedial strategies. Lastly, 23 of the reports displayed a "blame and shame" or "pathological" (i.e., Grade D) culture that emphasized human behaviours and individual fault in their description of events.

The most commonly assigned MedSCIM ratings were: 1A, 1B, and 2A (Figure 3). Incident examples of varying MedSCIM ratings are illustrated in Figure 4.

Discussion

Within the CPhIR incident reporting program there are multiple optional fields where users may share more details about a medication incident. Additional information provided in these optional fields is then used in our analyses. Information contained in three optional fields, in particular, is important when conducting a MedSCIM assessment:

1. "Contributing Factors of This Incident"*;*
2. "Actions at Store Level"*;* and
3. "Shared Learning for ISMP Canada to Disseminate".

The degree of documentation relating to a medication incident (i.e., the number rating in MedSCIM assessment) correlates with the degree to which these reporting fields are completed (Figure 5). The majority of reports assigned a Level 1 rating had more than one of the optional fields completed. As more optional fields are included in an incident report, it is more likely that the reporter will allude to potential contributing factors to the incident, which is indicative of a Level 1 rating. This is best

exemplified by the fact that incidents which included all three optional fields of interest comprised a large number of Level 1 reports (104 of 271) (Figure 5). Based on this data, it also appears that "actions taken by the pharmacy" and "contributing factors" entries are particularly important to achieving a complete incident report, with the "shared learning" section supplementing information reported in these fields.

Although a complete level of documentation is desired, this parameter remains distinct from the level of culture maturity to medication safety. This was highlighted by the finding in our analysis that all reports carrying a maturity level of "pathological" had fully complete reports. As such, a complete report is not indicative of a high level of cultural maturity. Instead, the content within the reporting fields provides more details on how community pharmacies strive towards attainment of a positive medication safety culture, and thus serves as a better indicator of maturity.

In determining a reporter's perceived approach to patient safety culture or a pharmacy's maturity of culture to medication safety (i.e., the letter rating in MedSCIM assessment), the optional fields describing "actions taken by the pharmacy" and "shared learning" are assessed in addition to the mandatory incident description field (Figure 6). Almost all Grade A reports were documented with "actions taken by the pharmacy" or completed with both "actions taken by the pharmacy" and "shared learning" optional fields. A single incident in the Grade A category (1 of 222) (Figure 6) filled in the "shared learning" optional field alone. Reports with only the mandatory incident description field completed did not achieve the "Grade A" rating. Consideration of what system-based factors may have allowed the incident to occur, what solutions could be implemented to solve similar incidents at the local level, and sharing this learning with the broader pharmacy community was indicative of a highly developed and generative culture towards medication safety.

In our assessment of the factors that differentiated highly rated medication incident reports, we chose to examine reports that scored well on either domain of the MedSCIM tool, degree of documentation (i.e., Level 1) or maturity of culture to medication safety (i.e., Grade A), rather than reports that scored highly on both dimensions (i.e., Grade 1A). This approach allows for the data to be viewed from the perspective of COMPASS pharmacies who may excel in one element of medication safety culture but need improvement in the other.

When compared to the results from the 2019 MedSCIM assessment, it is evident that COMPASS pharmacies displayed a more positive culture with more complete reporting in 2020 (Table 2 and Table 3). Figure 7 shows the dramatic improvement; the green portion of the pie chart increased from 29% in 2019 to 77% in 2020. This change was driven by improvements in both degree of documentation and maturity of culture to medication safety. In 2019, less than half (41%) of medication incident reports were classified as "fully complete" while the majority of incident reports (78%) received in 2020 were deemed to be "fully complete". A significant improvement was also seen in the maturity of culture to medication safety, where the number of Level A incidents increased from 18% in 2019 to 64% in 2020.

Limitations

A MedSCIM assessment relies on the qualitative interpretation and analysis of narrative data within incident reports. The different categories within the Core Event: Degree of Documentation and Maturity of Culture to Medication Safety domains are not mutually exclusive to one another. It is possible that

some incidents may fall between two or more alphanumeric categories in the MedSCIM framework. The assessment and trends presented in this report were derived from the individual interpretations and subsequent consensus generated between the two Medication Safety Analysts at ISMP Canada. Comparisons made between the years investigated should be interpreted with the understanding that these two sampling periods may not be sufficient to determine a trend. Furthermore, this analysis was based on incidents causing harm, meaning that a review of near-miss or no harm incidents may yield different results.

Conclusions

Overall, COMPASS pharmacies continue to demonstrate many areas of strength with respect to their patient safety culture. Most incidents associated with patient harm were reported with a sufficient level of detail to describe what medication incident occurred and also specified potential contributing factors to the incidents (Figure 1). Additionally, the majority of COMPASS pharmacies demonstrate a "generative" approach and considered what system-factors may have allowed the incidents to occur and offered solutions to the identified problems (Figure 2).

In comparison to the 2019 report, COMPASS pharmacies have transitioned towards a "generative" culture with more "fully complete" reporting of medication incidents (Figure 7). However, it is difficult to presume a true trend based on only two analyses. Additional data is required to conclude whether COMPASS pharmacies are indeed on the right track.

To improve their patient safety culture, COMPASS pharmacies should focus on fostering an environment where incident reporting is valued as a means to prevent patient harm. Community pharmacies that embrace a just culture and provide psychological safety to their staff are well positioned to be leaders in patient safety.

COMPASS pharmacies should also be encouraged to use the CPhIR incident reporting platform to its fullest extent. Pharmacies who thoroughly document medication incidents using the relevant optional fields are likely also implementing their suggested patient safety improvements in their own practices. Going forward, all COMPASS pharmacies should strive to achieve a stronger patient safety culture.

Acknowledgements

ISMP Canada would like to acknowledge support from the Ontario Ministry of Health and Long-Term care for the development of the Community Pharmacy Incident Reporting (CPhIR) Program. The CPhIR Program also contributes to the Canadian Medication Incident Reporting and Prevention System (CMIRPS). A primary objective of CMIRPS is to analyze medication incident reports and develop recommendations for enhancing medication safety across all healthcare settings. The incidents anonymously reported by COMPASS pharmacies to CPhIR were extremely helpful in the preparation of this analysis.

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Table 1 – Definition of MedSCIM Dimensions and Outcomes[4]

MedSCIM Index	OUTCOME	DEFINITION
Core Event	Level 1: **Report fully complete**	The medication incident provides sufficient information to describe the medication incident and contributing factors.
	Level 2: **Report semi-complete**	The medication incident provides sufficient information to describe the medication incident. No information is provided about contributing factors.
	Level 3: **Report not complete**	The medication incident provides insufficient information to allow meaningful qualitative analysis.
Maturity of Culture to Medication Safety (Modification of Ashcroft et al.[2])	Grade A: **Generative**	The medication incident uses a systems-based approach to describe the root cause and develop possible solutions to prevent future recurrence.
	Grade B: **Calculative**	The medication incident uses a systems-based approach to describe the root cause. No solutions are offered to prevent future recurrence.
	Grade C: **Reactive**	The medication incident is treated as an isolated incident. No solutions are offered to prevent future recurrence.
	Grade D: **Pathological**	The medication incident focuses on human behaviours instead of a systems-based approach.

Table 2 – Comparison of Degree of Documentation between 2019 (*n* = 255) and 2020 (*n* = 346)

Degree of Documentation	2019		2020	
	Number of Incidents	Frequency	Number of Incidents	Frequency
Level 3 – Report not complete	8	3.1%	4	1.2%
Level 2 – Report semi-complete	142	55.7%	71	20.5%
Level 1 – Report fully complete	105	41.2%	271	78.3%

Table 3 – Comparison of Maturity of Culture between 2019 (*n* = 255) and 2020 (*n* = 346)

Maturity of Culture to Medication Safety	2019		2020	
	Number of Incidents	Frequency	Number of Incidents	Frequency
Grade D: Pathological	51	20.0%	23	6.7%
Grade C: Reactive	120	47.1%	52	15.0%
Grade B: Calculative	39	15.3%	49	14.2%
Grade A: Generative	45	17.6%	222	64.1%

Figure 1 – Core Event: Degree of Documentation (*n* = 346)

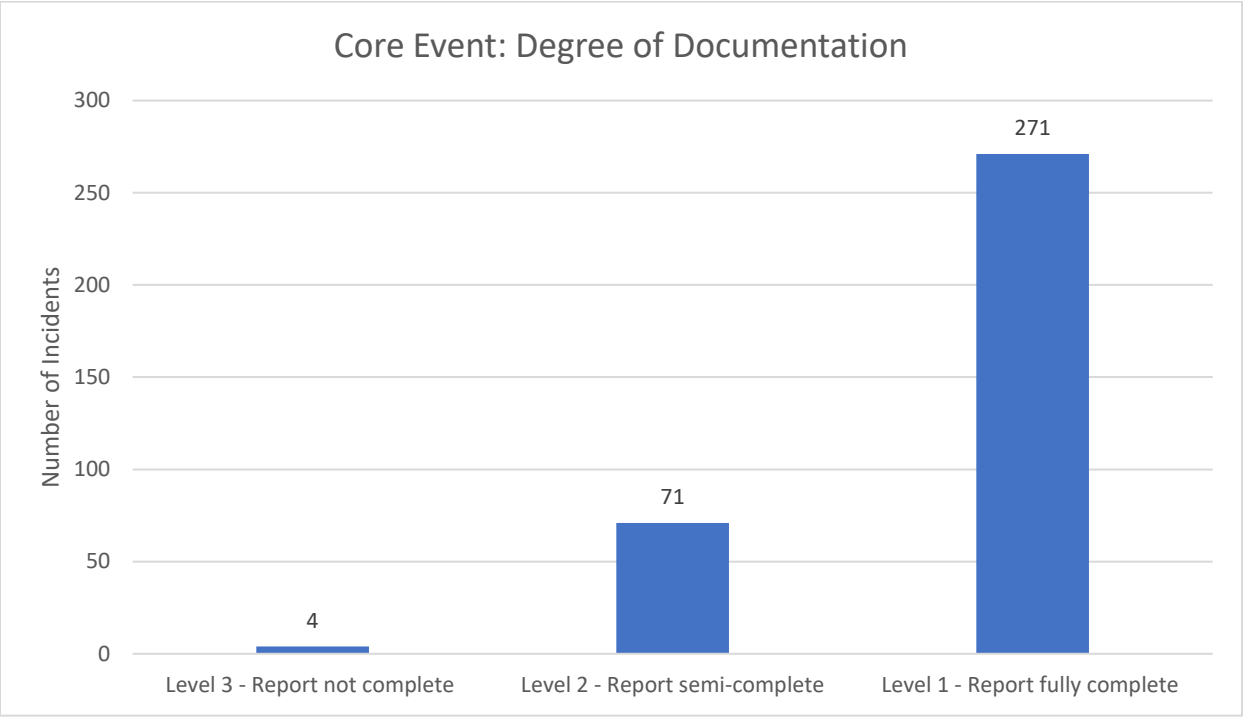

Figure 2 – Maturity of Culture to Medication Safety (*n* = 346)

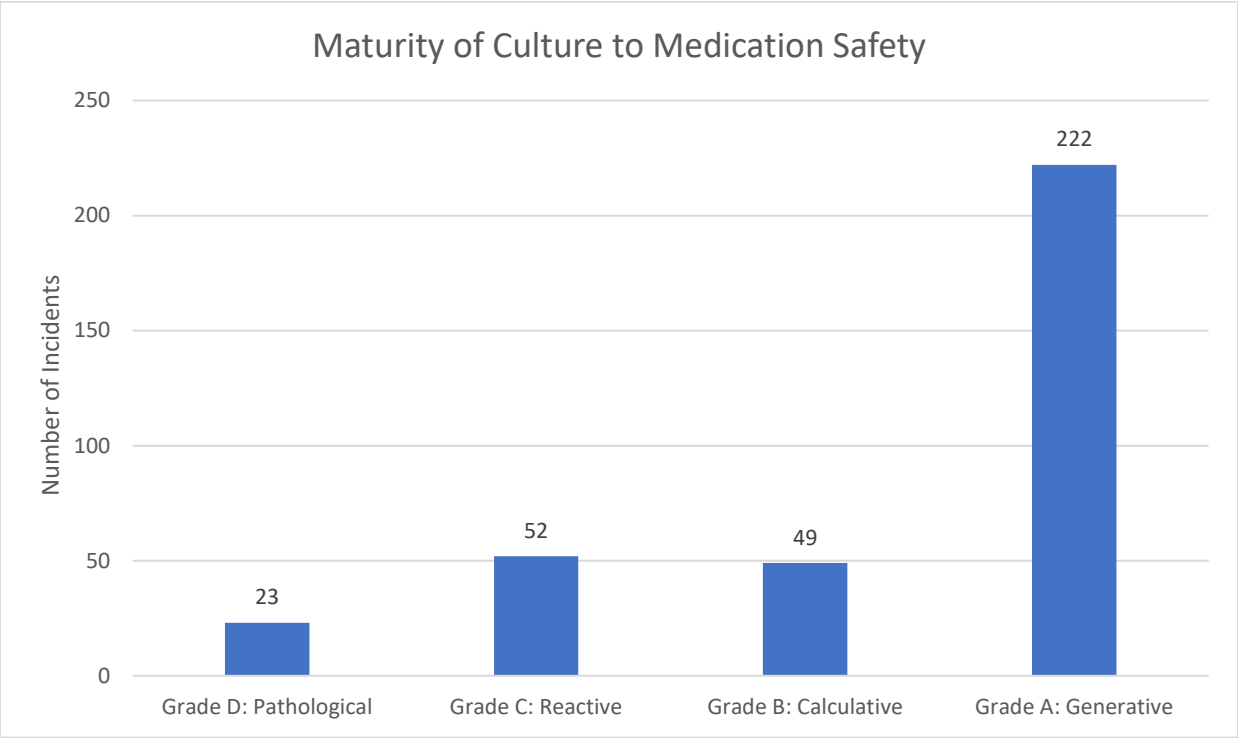

Figure 3 – MedSCIM Assessment (*n* = 346)

	Grade D: Pathological	Grade C: Reactive	Grade B: Calculative	Grade A: Generative
Level 1: Report fully complete	23	17	45	186
Level 2: Report semi-complete	0	32	3	36
Level 3: Report not complete	0	3	1	0

Figure 4 – Incident Examples of Varying MedSCIM Ratings

Incident Examples *(edited for clarity or to remove identifiable factors)*		Core Event: Degree of Documentation	Maturity of Culture to Medication Safety
#1	A nurse practitioner gave a verbal prescription for Clavulin 500 for a UTI. We have a documented penicillin allergy on file (unknown reaction), but the pharmacist cleared the error and did not follow up. The medication was picked up by a family member that evening, and the patient took one dose. Nurse called the next morning and realized that patient was allergic to penicillin so a script was given for Macrobid instead. Although the prescription was still in the pharmacy (i.e., status said "outbox"), it had not been scanned out. Patient was called and she verified that she took one dose, but only experienced an increased in perspiration; no rash, swelling, etc. Told her to not take any more of that medication and a new one will be sent out instead. ***Actions at Store Level***: This pharmacist is no longer working here.	1	D
#2	Refill re-authorization was sent back to pharmacy from the doctor's office. The computer generated one was for Telmisartan and the doctor added in Atacand. One pharmacist checked the Telmisartan (which showed 0 days early) and another pharmacist checked the Atacand (new drug-drug interaction). Patient received both medications and took them both for 15 days. Doctor and patient were both notified, and patient was told to stop Atacand. ***Actions at Store Level***: N/A	2	C
#3	Cancer clinic faxed a prescription to pharmacy for Allopurinol 300 mg daily for 2 weeks. The prescription was entered as Allopurinol 300 mg […] 1 tablet TID for 2 weeks and dispensed. The patient was taking it three times daily. A week later, the patient phoned the clinic and said that he was experiencing severe nausea with his Allopurinol tablets. The physician discovered that he was taking them three times daily instead of once daily; since then, he only took them once a day. Later, the pharmacy was informed that a dispensing error occurred. The pharmacist realized that on the original prescription, the instructions were written as Allopurinol 300mg "tab" not "tid". The pharmacist phoned the patient, apologized and asked the patient how he is feeling now. He said he is feeling better since he is taking Allopurinol once daily. The pharmacist apologized again and assured that the mistake will not happen again. ***Actions at store level***: Share the incident with pharmacy team members at staff meeting. Encourage independent double check at order entry and dispensing stages. Counter check original prescription with pill bottle when dispensing.	1	A

Figure 5 – Breakdown of "Level 1" Documentation Ratings by Optional Fields Entered (*n* = 271)

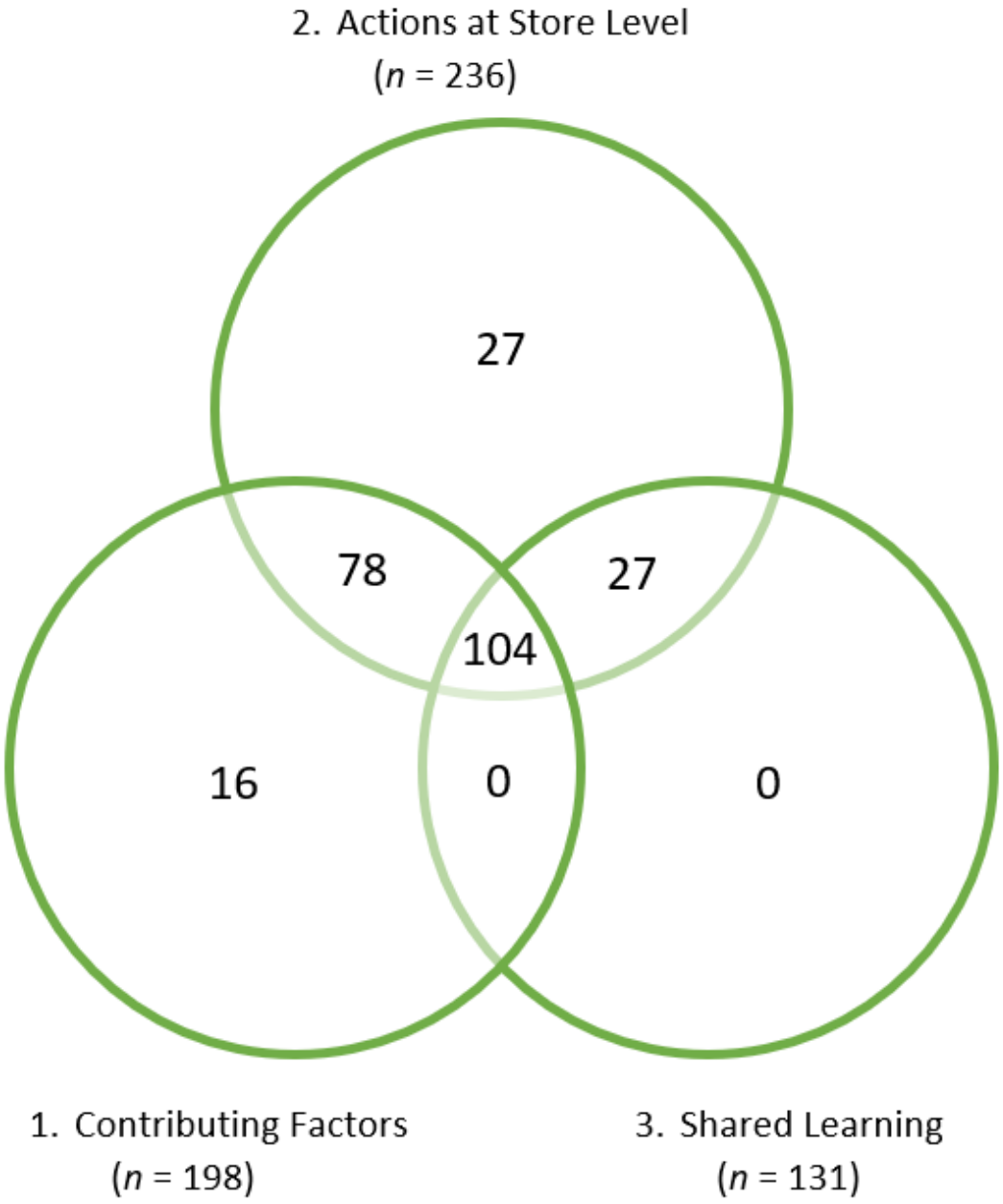

Figure 6 – Breakdown of "Grade A" Culture Ratings by Optional Fields Entered (*n* = 222)

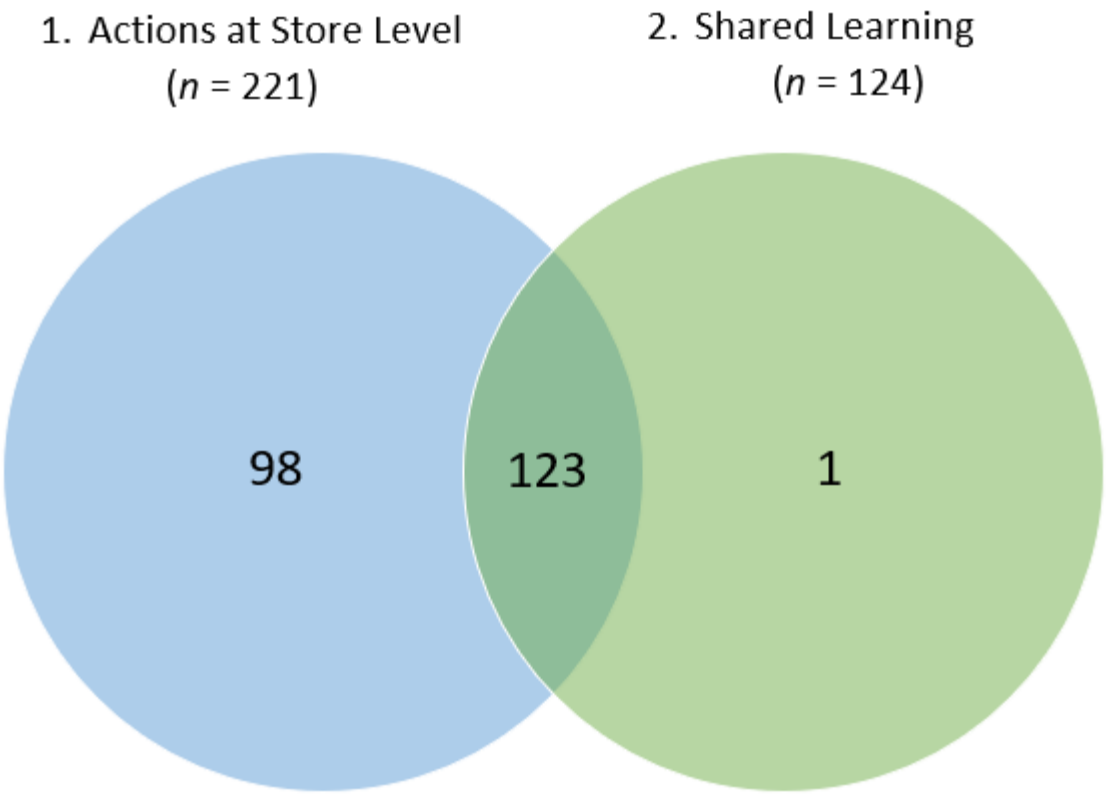

Figure 7 – MedSCIM Assessment 2019 vs. 2020