Report to the

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

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

2022 Edition

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Table of Contents

Background

Quality improvement initiatives have been implemented in several provinces to enhance patient safety and foster a positive safety culture. A critical component of these initiatives is community pharmacy participation in the anonymous reporting of medication incidents combined with the analysis of medication incidents for the purpose of shared learning.

To promote comprehensive incident reporting, pharmacies must strive to transition from a "blame and shame" culture that emphasizes individual fault, to a culture that focuses on system factors and generates solutions that would prevent errors from happening in the future.[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 use the Medication Safety Culture Indicator Matrix (MedSCIM) to examine the medication safety culture demonstrated by Saskatchewan community pharmacy professionals, and to provide a comparison with the previous MedSCIM assessments conducted in 2019 and 2020.[3]

Methods

All COMPASS pharmacies report medication-related incidents to the Community Pharmacy Incident Reporting (CPhIR) program.[4] When submitting the incident report, users are required to complete certain fields such as: type of medication incident, the medications involved, and a description of the medication incident. For the purposes of incident analysis and shared learning, the information from these mandatory fields is coupled with data from optional fields, such as actions taken at the store level and contributing factors.

During the 19-month reporting period from September 1, 2020, to March 31, 2022, 349 incidents associated with patient harm were reported by COMPASS pharmacies. Among these incidents, 27 were omitted for varying reasons: one incident was assessed to be “not applicable”; seventeen incidents were concluded to be adverse drug reactions instead of medication incidents; and nine incidents were determined to be duplicate reports. Therefore, a total of 322 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:[5]

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 (Report fully complete) to 3 (Report not complete) (Table 1).[5]
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 (Generative) to D (Pathological) (Table 1).[5]

Results

The reports from COMPASS pharmacies had varying degrees of documentation, ranging from fully complete to not complete (Figure 1). Sixty-five percent of the reported incidents (209 of 322) 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 31% of the incidents (101 of 322) were deemed to be "semi-complete" (i.e., Level 2), as their level of documentation was sufficient to describe the medication incident but offered no potential contributing factors. Less than 4% of the incidents (12 of 322) were deemed to be "not complete" (i.e., Level 3), where details of the medication incident remained unclear.

Additionally, COMPASS pharmacies demonstrated some variability in their maturity of culture to medication safety (Figure 2). About 25% (79 of 322) 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; system flaws were identified, and solutions were offered with the aim of preventing error recurrence. Meanwhile, 34% (110 of 322) of the reports fit within the "calculative" (i.e., Grade B) culture, whereby the reporters considered how the medication system may have allowed the incident to occur but did not advance remedial strategies. A "reactive" (i.e., Grade C) culture was identified in 31% (101 of 322) of the reported incidents. These reports treated incidents as isolated events and did not approach the incidents from a system-based perspective or offer a solution. Lastly, 10% (32 of 322) 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, in decreasing order, were: 1B, 1A and 2C (Figure 3). Incident examples of varying MedSCIM ratings are described in Figure 4.

Discussion

There are multiple optional fields within the CPhIR incident reporting program where users can provide additional details about a medication incident. As part of this analysis, the information from these optional fields was considered alongside the information from required fields. The following three optional fields are particularly 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 level 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. It was found that 207 of the 209 reports that were assigned a Level 1 rating had one or more of the optional fields completed (Figure 5). The likelihood that the reporter will mention potential contributing factors increases as more optional sections are completed, leading to more thorough documentation. This is demonstrated by the finding that 33% of the 209 Level 1 incident reports included all three optional fields of interest (Figure 5). Also, 42% of the 209 Level 1 reports had both "Contributing Factors of This Incident" and "Actions at Store Level" fields completed. Based on this data, it appears that these two entries are especially important to achieving a fully complete incident report, with the "Shared Learning for ISMP Canada to Disseminate" section supplementing information reported in these fields.

While complete documentation is important, it is only the first step towards a positive patient safety culture. It is important to note that a complete report is not indicative of a high level of cultural maturity. This is supported by the finding that the 32 pathological reports had semi- (Level 2) or fully (Level 1) complete documentation. The maturity of culture to medication safety indicator allows for examination of the information contained within the reporting fields, thereby providing greater insight into how community pharmacies work to establish a supportive culture for medication safety.

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 contributing factors, actions at store level and shared learning are assessed in addition to the mandatory incident description field (Figure 6). The 79 Grade A reports completed the "Actions at Store Level" optional field. Almost half of these reports also included the "Shared Learning for ISMP Canada to Disseminate" optional field. Reports with only the mandatory incident description field completed did not achieve the "Grade A" rating. Consideration of what solutions could be implemented to prevent 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.

Comparison between 2020 and 2022

When compared to the results of the 2020 MedSCIM assessment, it was found that COMPASS pharmacies continued to show strength with respect to complete documentation in 2022 (Table 2). The majority of incident reports continue to be classified as Level 1, indicating that COMPASS pharmacies are describing the incidents in

sufficient detail and considering system-based factors that allow incidents to occur. Overall, the frequency of level 1, 2 and 3 reports are similar between the 2020 and 2022 assessments.

Unlike degree of documentation, the maturity of culture indicator showed significant differences when comparing the 2020 and 2022 analyses (Table 3). The frequency of reports that are generative (Grade A) decreased from 64.1% in 2020 to 24.5% in 2022. Additionally, there was a roughly two-fold increase in the frequencies of reactive (Grade C) and calculative (Grade B) reports. While reports from the 2020 analysis were mostly generative by a wide margin, the 2022 analysis indicated that the frequencies of reactive, calculative, and generative reports are more evenly distributed. Also, pathological (Grade D) reports still compose a minority of the reports in 2022, suggesting that COMPASS pharmacies are still less likely to attribute blame to individuals when reporting medication incidents.

Trend analysis from 2019 to 2022

In Figure 7, both dimensions of the MedSCIM tool are considered to compare the results of the 2022 MedSCIM assessment with results from the analyses in 2019 and 2020. From 2019 to 2020, there was significant improvement in the frequency of reports characterized as having a positive patient safety culture (Table 4); the frequency increased from 29% to 77%. In 2022, it was observed that the number of reports indicating a positive patient safety culture, decreased from 77% in 2020 to 51% in 2022. This change was mainly driven by a decrease in generative (Level A) reports. Despite a decrease in the number of 2022 reports indicating a positive safety culture compared to 2020, this is still a remarkable improvement from the 29% found in 2019.

The decrease in generative reports may be attributed to the COVID-19 pandemic. The reporting period for this analysis coincided with the introduction of the COVID-19 vaccines as well as several waves of disease spread. This impacted community pharmacies through lockdowns, increased sanitation protocols, staffing challenges, and pivots in business functions in response to increased vaccination efforts. In contrast, the reporting period for the 2020 MedSCIM analysis only captured the early stages of the pandemic. The drastic changes to healthcare that came with the pandemic led to changed processes and busier pharmacies, which may have made it more difficult for most pharmacies to maintain their positive medication safety culture through reporting.

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. It should be noted that the analysts that interpreted the data from this reporting period were different from the previous periods. Comparisons made between the years investigated should be interpreted with the understanding that these three

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 excel in many areas of patient safety culture. Most reports from the 2022 assessment were classified under a positive medication safety culture (Figure 3), suggesting that COMPASS pharmacies are submitting detailed reports that use a system-based approach to address possible causes of the incident. The majority of patient harm incidents were reported with enough detail to include information about the medication incident as well as potential contributing factors (Figure 1). Furthermore, reports of a pathological medication safety culture still represent the minority, which demonstrates that a significant proportion of COMPASS pharmacies have moved away from a blame-and-shame culture that emphasizes individual fault (Figure 2).

In comparison to the 2020 assessment, COMPASS pharmacies have made significantly fewer reports that consider system-based solutions to the identified problems. Therefore, the number of reports that indicate a generative medication safety culture has decreased significantly (Table 3). This is likely because the reporting period for this analysis was during the peak of the COVID-19 pandemic, a time in which community pharmacy teams were under significant stress.

COMPASS pharmacies are encouraged to use elements of the CPhIR platform to support a thorough review of medication incidents. When documenting medication incidents, pharmacies should use the checklist of contributing factors as a guide towards understanding how and why the incident occurred. Additionally, pharmacies should reflect on the actions that can be taken to prevent similar errors in the future. When this reflection is captured with the relevant optional fields, the report is more likely to be thorough and demonstrate a commitment to patient safety improvements.

Generally, COMPASS pharmacies are considering system-based contributing factors to medication incidents. As a next step, pharmacies are encouraged to propose solutions that will address the identified root causes of these incidents. This can be achieved by creating an environment where error reporting is valued as a means to prevent patient harm. Community pharmacies that adopt a just culture and provide psychological safety to their staff are more likely to drive patient safety forward and create a positive medication safety culture within their organization.

Acknowledgements

ISMP Canada would like to acknowledge COMPASS pharmacies that anonymously reported incidents to the Community Pharmacy Incident Reporting (CPhIR) program. The CPhIR program contributes to the National Incident Data Repository for Community Pharmacies (NIDR) of 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.

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Table 1 – Definition of MedSCIM Dimensions and Outcomes

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 2020 (*n* = 346) and 2022 (*n* = 322)

Degree of Documentation	**2020 (*n* = 346)**		**2022 (*n* = 322)**	
	Number of Incidents	Frequency	Number of Incidents	Frequency
Level 3 – Report not complete	4	1.2%	12	3.7%
Level 2 – Report semi-complete	71	20.5%	101	31.4%
Level 1 – Report fully complete	271	78.3%	209	64.9%

Table 3 – Comparison of Maturity of Culture between 2020 (*n* = 346) and 2022 (*n* = 322)

Maturity of Culture to Medication Safety	2020 (*n* = 346)		2022 (*n* = 322)	
	Number of Incidents	Frequency	Number of Incidents	Frequency
Grade D: Pathological	23	6.7%	32	9.9%
Grade C: Reactive	52	15.0%	101	31.4%
Grade B: Calculative	49	14.2%	110	34.2%
Grade A: Generative	222	64.1%	79	24.5%

Figure 1 – Core Event: Degree of Documentation in 2022 (*n* = 322)

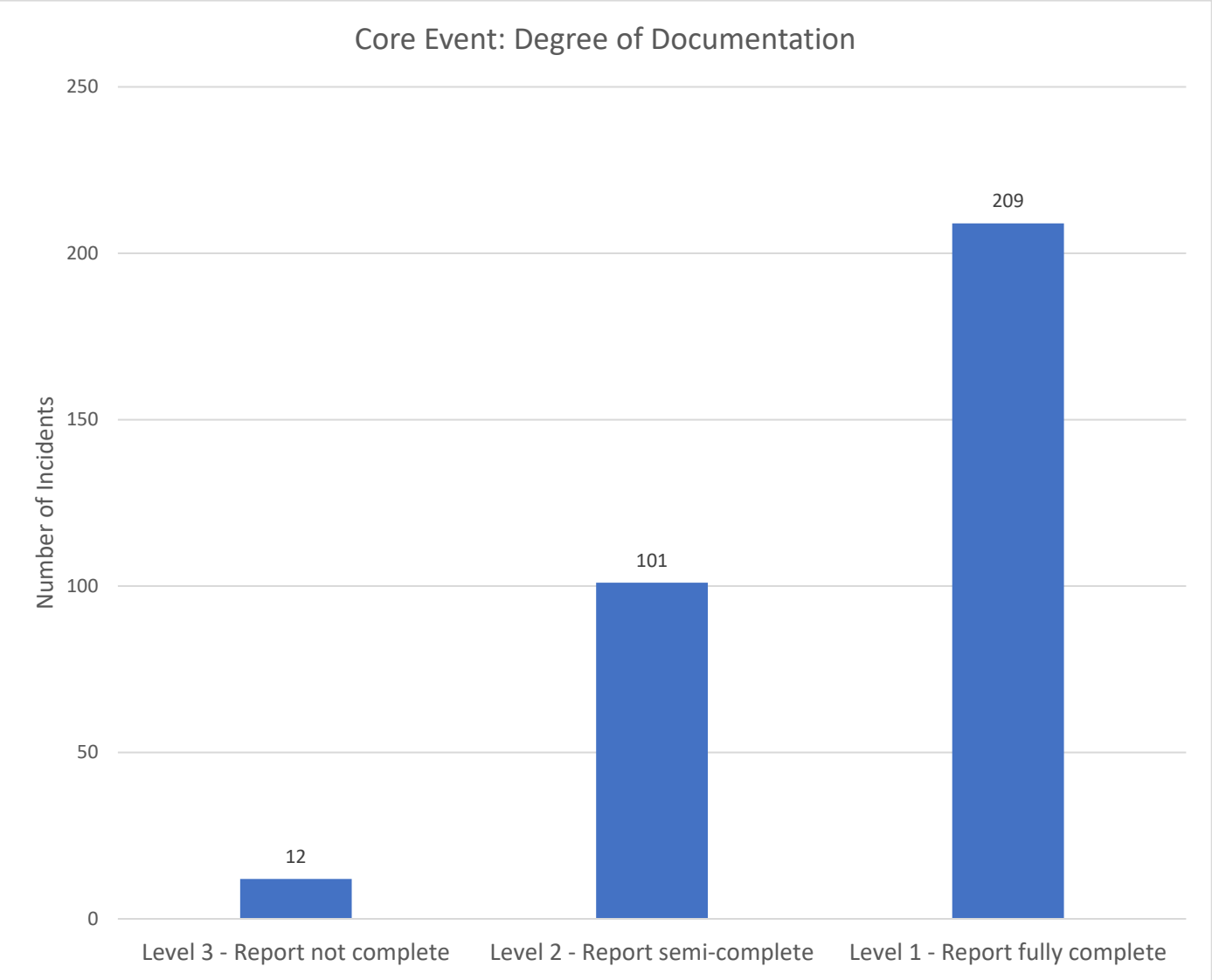


Figure 2 – Maturity of Culture to Medication Safety in 2022 (*n* = 322)

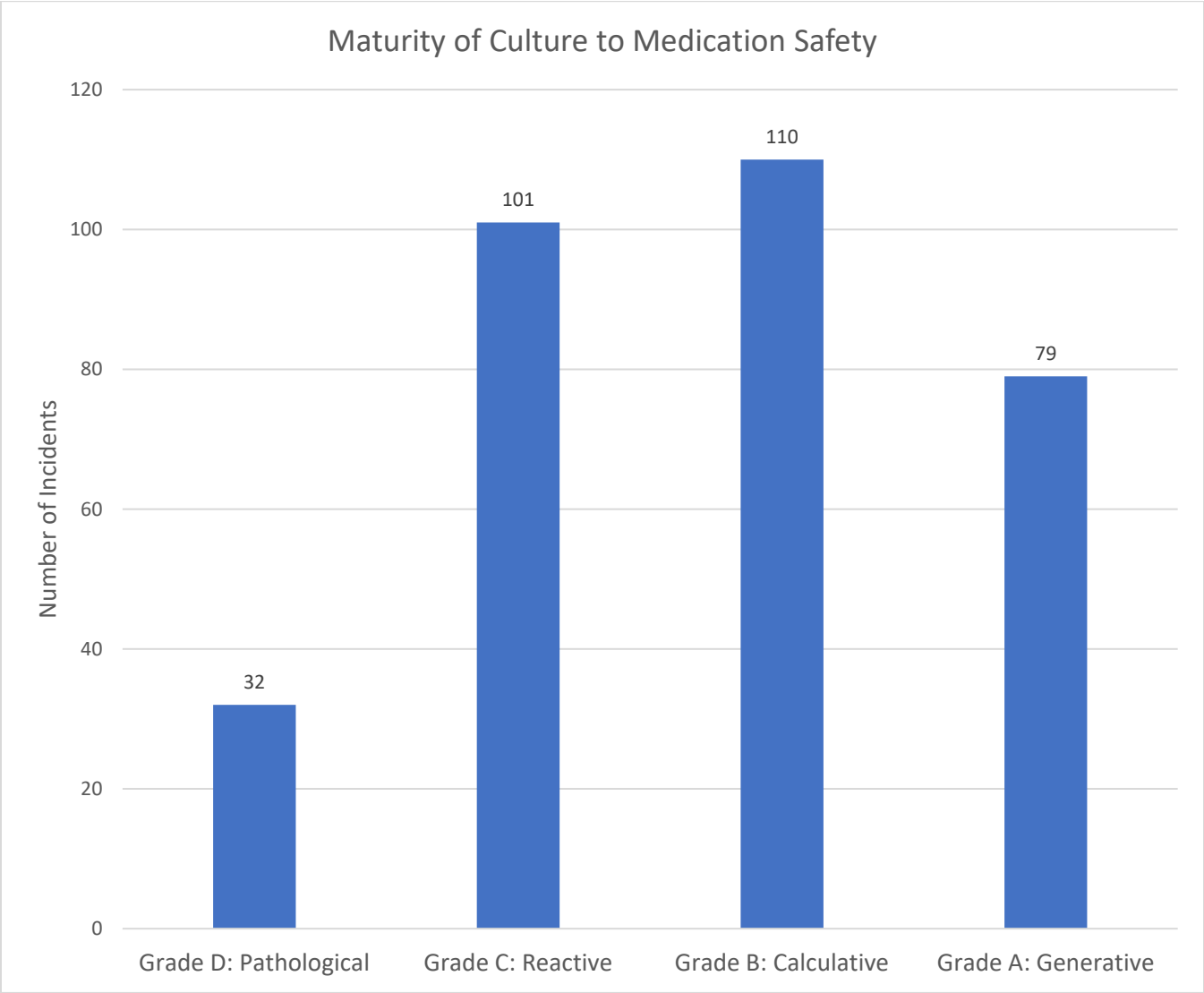


Table 4 – Classification of Medication Safety Culture

Medication Safety Culture	Corresponding MedSCIM ratings
Negative	1D, 2D, 3A, 3B, 3C, 3D
Neutral	1C, 2B, 2C
Positive	1A, 1B, 2A

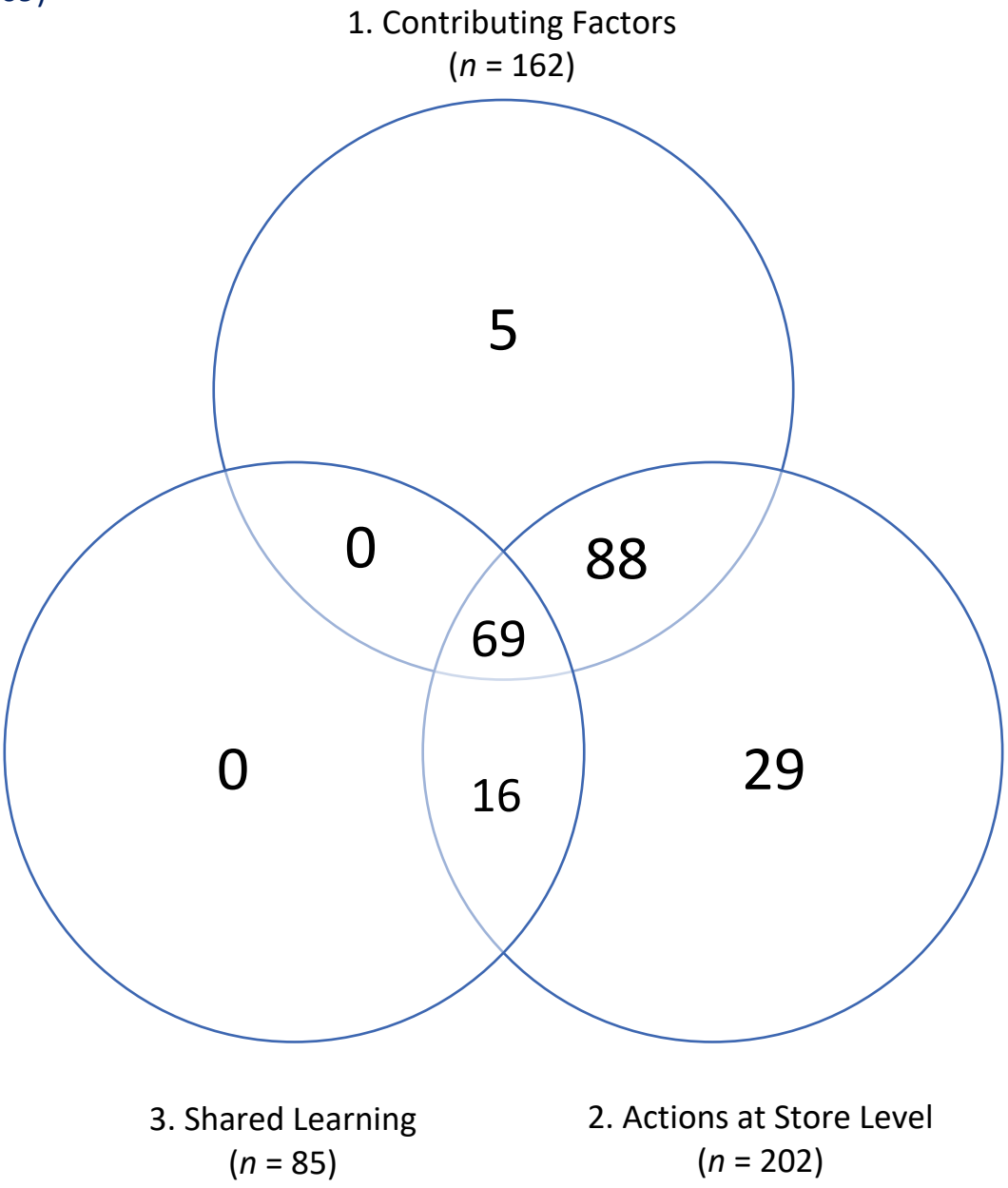
Figure 3 – MedSCIM Assessment in 2022 (*n* = 322)

	Grade D: Pathological	Grade C: Reactive	Grade B: Calculative	Grade A: Generative
Level 1: Report fully complete	**19**	**35**	**84**	**71**
Level 2: Report semi-complete	**13**	**56**	**24**	**8**
Level 3: Report not complete	**0**	**10**	**2**	**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 prescription for methadone 10 mg was prepared as methadone 100 mg by a relief pharmacist. The methadone stock solution has a concentration of 10 mg/mL; 10 mL was mixed with juice instead of 1 mL. The patient consumed about half (50 mg) when the pharmacist realized that an error was made. The patient's doctor was contacted and advised that the patient be observed for a couple of hours for severe drowsiness. Poison control was contacted, and an ambulance was called. The patient was taken to the hospital for observation. **Actions at store level:** Prescriptions for methadone will be prepared and checked by a staff pharmacist who is familiar with the processes instead of a relief pharmacist.	1	D
#2	The patient was previously taking quetiapine XR 150 mg daily as 3 x 50 mg tablets. Their dose increased to 200 mg daily, and the pharmacy filled the 200 mg tablets. The dispensing pharmacist made a note on the transaction and on the bag about the change, however the patient does not remember being told about the change. The patient took 4 of the 200 mg tablets. The patient recovered from the error. **Actions at store level:** N/A	2	C
#3	A prescription for duloxetine 30 mg two capsules daily was changed by the pharmacy assistant to duloxetine 60 mg one capsule daily. However, the patient was not counselled or notified of the change and continued to take two capsules daily of the higher dose in error. The patient started to feel unusual, so the pharmacy was called, and the pharmacist confirmed that the patient should only be taking one capsule as the prescription had been changed to the 60 mg strength. **Actions at store level:** This incident will be shared with the pharmacy team. Any changes to brands, dose and instructions should be noted for the patient so that the patient is aware when a change has been made to a refill prescription. All deliveries should have a follow-up with the patient once the medication is received and the counselling should occur on the phone to confirm all the received medications are correct and are expected. This process change will be implemented immediately.	1	A

Figure 5 – Breakdown of "Level 1" Documentation Ratings by Optional Fields Entered in 2022 (n = 209)



Note: Two out of 209 Level 1 reports did not include any of the 3 optional fields.

Figure 6 – Breakdown of "Grade A" Culture Ratings by Optional Fields Entered in 2022 (*n* = 79)

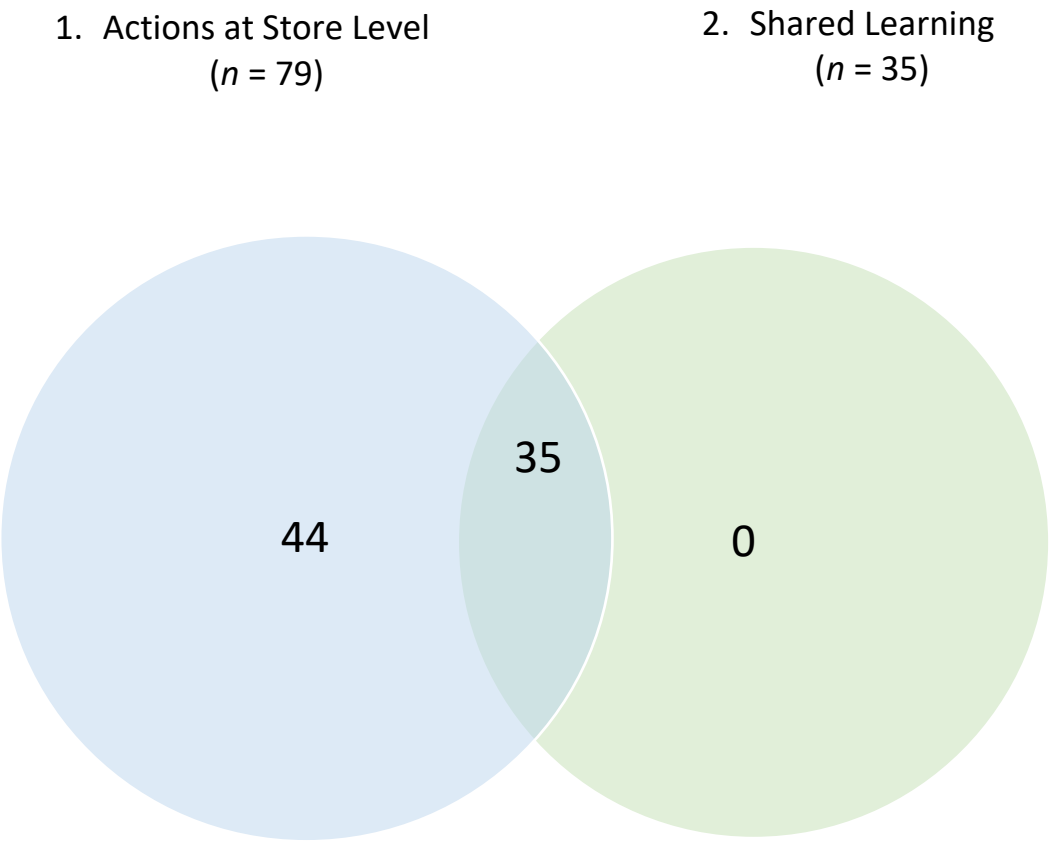


Figure 7 – Comparison of Medication Safety Culture