

Development of a Medication Management Program for Developmental Support Workers

by © Julia Bennett

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Abstract

Background: Medication errors are a worldwide health care problem, which poses a risk to patients, caregivers, and the healthcare system. This risk can be mitigated through effective medication management. At Momentum Developmental Support, developmental support workers (DSWs) provide 24-hour residential care for adults with intellectual disabilities, province wide (Newfoundland). However, DSWs receive minimal training in medication management. Consequently, this could lead to a rise in medication errors, negatively impacting client safety. **Purpose:** The aim of this practicum project is to develop a medication management program to improve DSWs' knowledge, confidence, and skills about medication management. **Methods:** Three key methods were used to develop the medication management resource: 1) an extensive literature review, 2) consultations with managers and DSWs at Momentum, and 3) an environmental scan of available resources. **Results:** The literature review identified a lack of medication knowledge, confidence, and skills among DSWs, primarily attributed to the absence of hands-on training, which could potentially lead to medication errors. Consultations further confirmed the lack of consistent training and resources for medication management, with a preference for classroom-based learning as the most effective teaching strategy. The environmental scan aligned with these findings, emphasizing the significance of combining theoretical and practical learning in a classroom setting while highlighting the challenges associated with online learning. **Conclusion:** A half-day medication management workshop was developed to strengthen DSW's knowledge, confidence, and skills about medication management. **Key Words:** *medication management, developmental support workers, educational workshop, knowledge*

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Introduction

Medication errors are a worldwide health care problem, which poses a risk to patients, caregivers, and the healthcare system (Godfrey et al. 2013). There are many negative impacts associated with medication errors such as increased length of stay for patients, increased healthcare costs, and poor caregiver mental health (McCarthy et al., 2017; Sim et al., 2022; Treiber & Jones, 2018). Effective management of medications can prevent medication errors and the negative consequences associated with these errors. According to The College of Registered Nurses of Newfoundland and Labrador (CRRNL) (2019), medication management is an important aspect of quality client-centered care, which involves more than just the administration of medication, but instead a combination of knowledge, skill, critical thinking, and decision-making. While licensed caregivers (i.e., registered nurses [RN]) typically provide hospital-based care, unlicensed caregivers (i.e., developmental support workers [DSWs]) provide much of community-based care. Although unlicensed caregivers are permitted to engage in medication management tasks with proper education and training (Shore et al., 2022), education and training in the home care setting is not held to high standards (Godfrey et al., 2013). Consequently, caregivers lack proper education on medication management, putting them at a high risk of making medication errors (Burgdorf et al., 2022). This could significantly influence client safety, putting them at risk of an adverse drug event (ADE) (Assiri et al., 2018).

At Momentum Developmental Support, unlicensed caregivers called developmental support workers (DSWs) provide care for clients with intellectual disabilities. As part of onboarding and orientation, DSWs receive only an hour of medication management training. This is a gap in training as it is not nearly enough time or educational content to ensure DSW's are well versed in medication management. The findings from consultations support this

indicating that 100% of managers rated the current medication management program as fair, with 66% of them feeling only somewhat comfortable engaging in medication management tasks. In relation, 46% of DSWs reported witnessing a coworker make a medication error at least once. The goal of this project was to develop a medication management program for DSWs. This required an extensive literature review, consultations, and an environmental scan. The findings from three methods were compared to determine similarities and differences and use the most significant findings to inform the development of the medication management program. Offering this training to developmental support workers may help strengthen their knowledge, confidence, and skills about medication, thereby leading to improved client safety.

Objectives

The overall goal of the practicum was to develop a medication management program for developmental support workers. The key practicum objectives were to:

1. Identify current learning resources and evaluate their applicability to the proposed medication management program, informing both the content and the most effective teaching strategies.
2. Assess whether developmental support workers have the knowledge and confidence related to medication management.
3. Determine and understand the specific local needs regarding the medication management training for DSWs at Momentum.
4. Identify and engage with key stakeholders within Momentum to gather information and recommendations, contributing to the development of a medication management program for DSWs.

5. Identify strategies and interventions that have been used to address medication management issues.
6. Develop a medication management program for developmental support workers based on the principles of Experiential Learning Theory and Knowles' Adult Learning.
7. Demonstrate advanced nursing practice competencies.

Overview of Methods

There were three main methods used to inform the development of this practicum project. This included an extensive literature review to examine medication management as an issue among unlicensed and licensed caregivers, as well as proposed interventions, consultations with key stakeholders to gather local information and data, and an environmental scan to review and examine the current learning resources about medication management. Three drafts of the literature review, consultation report, and environmental scan report were submitted for feedback and revisions were made accordingly.

Summary of the Literature Review

Methods

For the literature review (See Appendix A), the following databases were used: Cumulative Index to Nursing and Allied Health (CINAHL), PubMed, Cochrane library, and Google Scholar. Google Scholar and government websites were also used to search for grey literature. Quantitative, qualitative, and mixed methods research studies published in English only were included in this review. The following key words were used: "*direct support professional*", "*medication management*", "*impact of medication errors*", "*training programs*", "*unlicensed caregiver*", "*nurse*", "*home support worker*", "*medication error*", "*workshop*", "*education*", "*strategies*", "*knowledge*", "*confidence*", and "*skills*". Limits for this literature

review consisted of articles published in peer-reviewed journals and dated 2013-2023, with the exception of literature used to describe theories. Literature summary review tables were used to summarize key findings from the discussed studies (See Appendix B).

Literature Review Key Findings

The main findings of the literature review were related to the impacts of medication errors, contributing factors, and interventions associated with medication errors among unlicensed and licensed caregivers. The lack of knowledge, skills, and confidence about medication management among unlicensed versus licensed caregivers was also discussed throughout the literature. The literature review highlighted the consequences of medication errors on clients, the healthcare system, and caregivers. Clients frequently experienced adverse drug events (ADEs) and extended hospital stays. The associated costs, both in terms of length of stay and ADE treatment, had significant impacts on the healthcare system. Caregivers, on the other hand, commonly experienced challenges related to mental health and self-confidence.

There were two main contributing factors associated with medication errors, individual and organizational factors. The individual factors include lack of training and education, unclear communication, and stress (Ali et al., 2021; Bengtsson et al., 2021; Castaldo, 2022; Dionisi & Di Simone, 2022; Hammoudi et al., 2018; Wondmieneh et al., 2020; Yousef et al., 2021). On the other hand, the organizational factors include workload, distractions during medication administration, and lack of clear policies/guidelines regarding medication management (Ali et al., 2021; Bengtsson et al., 2021; Castaldo, 2022; Dionisi & Di Simone, 2022; Hammoudi et al., 2018; Wondmieneh et al., 2020; Yousef et al., 2021).

A number of studies examined the impact of medication training and education on medication knowledge, skills, and confidence. The authors of these studies noted statistically

significant differences or positive feedback related to medication management education and training (Dubovi et al., 2017; Holland et al., 2013; Goodwin et al., 2022; Mariani et al., 2017; Vital & Nathanson, 2023). For example, Mariani et al. (2017), found a statistically significant difference between the number of students who passed the medication skills knowledge assessment in the group who received two simulations (57%), compared to the group who only received one simulation (28%) ($p=.02$).

Quality improvement projects were examined as an intervention in four studies, where two of these studies noted statistically significant results (Frye & Rushanan, 2023; Ganaden and Mitchell, 2018; Sim et al., 2022; Wagner, 2022). In particular, Frye and Rushanan (2023) found a statistically significant increase in mean medication management competency from 99.68 pre intervention to 124.24 post intervention ($p= .006$).

Four studies explored medication reconciliation as an intervention for medication management and all noted statistically significant results related to medication reconciliation and medication management (Aiezza et al., 2021; Hron et al., 2015; Stuijt et al., 2021; Young et al., 2015). For instance, Hron et al. (2015) found a statistically significant difference noted for non-intercepted medication reconciliation errors pre intervention (59) (4.1 per 1000 admissions) and post intervention (36) (2.0 per 1000 admissions) ($p= 0.02$).

While there were significant results noted among all three interventions, the most statistically significant effects were noted among studies that involved education and training. In addition, education and training was considered an important factor for preventing medication errors. As a result, the focus of my practicum project was to develop a medication management program for unlicensed caregivers (DSWs) at Momentum Developmental Support.

Theoretical Frameworks

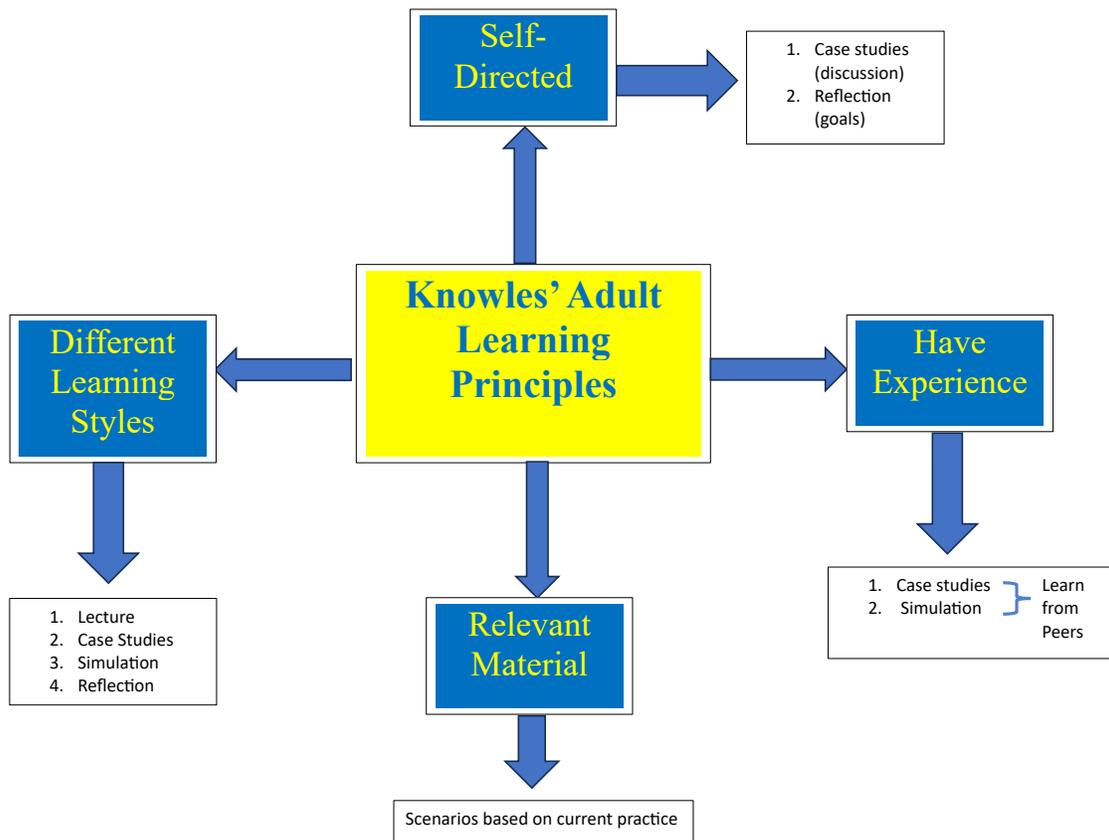
Two theoretical frameworks (The Knowles' adult learning theory and the Kolb's experiential learning theory) were used to guide the development of the medication management program.

Knowles' Adult Learning Theory

Knowles' adult learning theory contains a set of principles that are applicable to adult learners (Collins, 2004) (see Figure 1). Knowles' adult learning theory can be applied to support DSWs in learning about medication management by recognizing that adults learn best when the material is relevant to their lives and when they can apply what they learn immediately (Knowles, 1978). This theory was used to guide the content of the medication management program. For example, incorporating real-life scenarios based on current practice into the workshop using case studies and simulation allow participants to engage in self-directed discussion, relate to practice, and share experiences, which is beneficial. Furthermore, adult learners often connect prior life experience and knowledge to the learning process, so acknowledging and incorporating their existing knowledge into the training via a pre-test questionnaire can promote engagement and allow participants to determine areas of opportunity. As adult learners are self-directed, providing an opportunity for a reflection exercise with questions related to the simulation experience can allow participants to determine their future learning goals for medication management and develop a plan to meet these goals. Finally, adults appreciate a positive learning environment, so accommodating for different learning styles via various educational strategies further support the application of Knowles' adult learning theory in medication management training for DSWs.

Figure 1

Diagram of Knowles' Adult Learning Theory



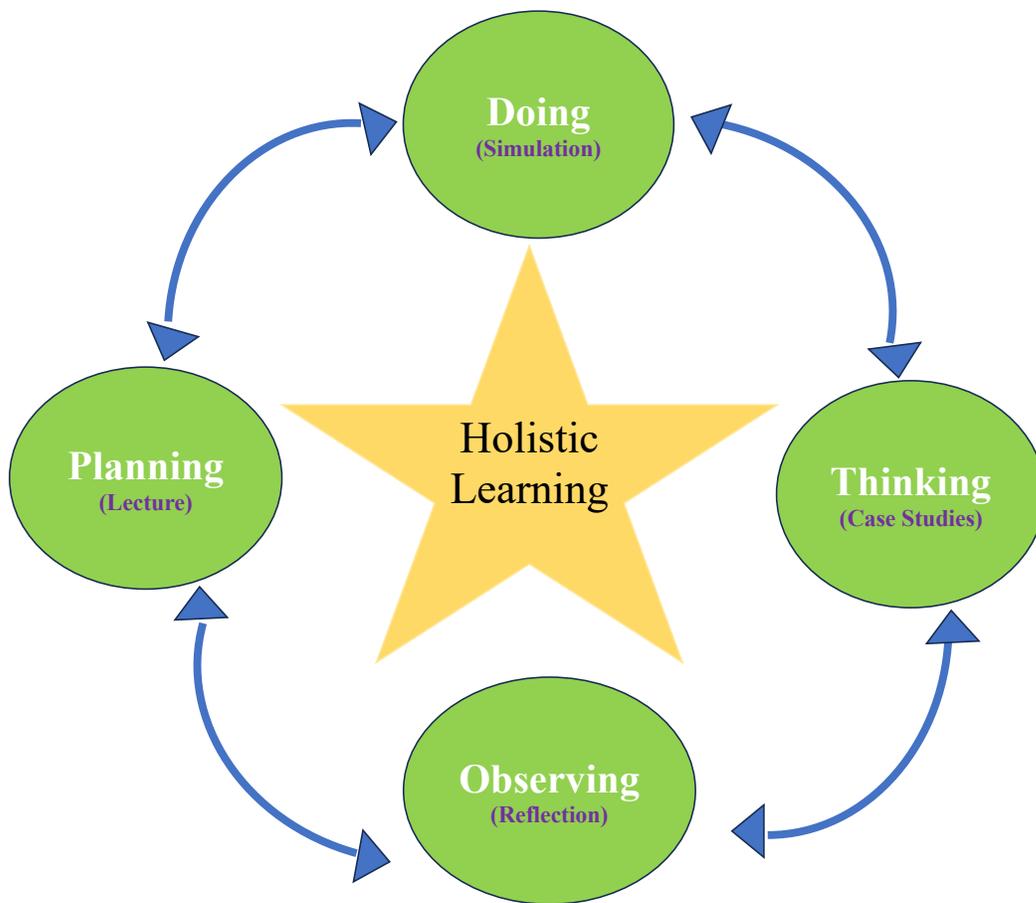
The Kolb's Experiential Learning Theory

The Kolb's (1984) experiential learning theory involves four domains including experience, perception, cognition, and behavior, where learning is viewed as a holistic approach, as opposed to an intellectual or physical approach. According to Sharlanova (2004), this theory involves a cyclical process, which involves doing, observing, thinking, and planning (see Figure 2). The doing phase involves actively completing a task either individually or as a group. The observing phase involves reflecting on the task that was completed to determine feelings about the task and what could be done differently. The thinking phase is when the learner tries to make sense of the task that was completed, while the planning phase involves planning to test a theory differently for future. This theory was mainly used to inform the different educational strategies

for the medication management workshop such as simulation (doing phase), reflection (observing phase), case studies (thinking phase), and lecture (planning phase). The experiential learning theory guides participants in practicing hands-on skills, but also in the development of learning through reflection and critical thinking.

Figure 2

Diagram of Kolb's Experiential Learning Theory



Summary of Consultations

Methods

Data for consultations was collected using a questionnaire developed using Microsoft

Forms. This consisted of four closed-ended and 14 open-ended questions and was based on consultation plan objectives. The training manager emailed the link to all managers and DSWs at Momentum. Employees who volunteered to complete the questionnaire clicked the online link and completed the questionnaire, which took approximately 15 minutes. A total of 275 surveys were distributed to DSWs and managers at Momentum, and only 31 participants completed the online survey. The link for the questionnaire remained open for 24 hours. To ensure quality of data, the questionnaire was set up so consultants could only view their own responses. This was done when developing the questionnaire, by enabling permissions in Microsoft Forms. This minimized the risk of response bias. In addition, the questionnaire was anonymous, and did not include any personal information.

Consultation Key Findings

The consultations revealed findings regarding medication management training among managers and DSWs at Momentum (See Appendix C). There were differences in the quantitative data among the managers and DSWs; however, the qualitative data was similar between both groups. As shown in Table 1, 31 employees chose to volunteer to complete the questionnaire. Of these participants, 90% (n=28) were DSWs and 10% (n=3) were managers at Momentum Developmental Support. Among DSWs, many rated the current medication management training at Momentum as good (46%) or excellent (39%) and reported feeling very comfortable engaging in medication tasks such as medication preparation (75%), administration (82%), documentation (82%), and storage (85%). The majority of DSWs (71%) agreed that the current medication management training adequately prepares employees. In addition, 46% reported experiencing a co-worker make a medication error, with two or three times being the most common occurrence of these errors (42%). In comparison, all managers who completed the questionnaire agreed that

the current medication management training at Momentum would be rated as fair, and 66% reported feeling somewhat comfortable for medication preparation, administration, documentation, and storage. Only 34% of managers agreed that the current medication management training adequately prepares employees. All managers indicated that they experienced a co-worker make a medication error at least once (66%).

Table 1

Quantitative Results of Consultation Questionnaire

| Questions | DSWs (n=28) | Managers (n=3) |
|-----------------------------------------------------------------|------------------------------|------------------------------|
| Rating of current medication management training program | 46% (good) | 100% (fair) |
| Current training adequately prepares employees | 71% (agreed) | 34% (agreed) |
| Comfort level engaging in medication tasks | Very Comfortable | Somewhat Comfortable |
| | 75% (medication preparation) | 66% (medication preparation) |
| | 82% (administration) | 66% (administration) |
| | 82% (documentation) | 66% (documentation) |
| | 85% (storage) | 66% (storage) |
| Experienced a coworker make a medication error | 46% | 100% |
| Occurrence of medication errors by coworkers | 42% (two or three times) | 66% (at least once) |

In addition, to the quantitative results, four major themes were also identified among the

qualitative data collected from DSWs. These four themes are *safe medication procedures, DSW knowledge and competence, educational strategies, and classroom-based learning*. Safe medication procedures were associated with medication management, while DSW knowledge and competence was related to the need for a medication management training program at Momentum. A variety of educational strategies and classroom-based learning was suggested when suggesting content and a mode of delivery for a medication management program.

The three common themes identified among the qualitative data in the management group were: *safe medication skills, standardized procedures, and experiential learning*. Similar to the DSWs, safe medication skills were used to define medication management. However, lack of consistency in training (i.e., standardized procedures) was related to the need for a medication management program at Momentum. In addition, experiential learning was associated with content and the mode of delivery of the medication management program. The quantitative results found a greater perception of need for a medication program at Momentum among managers versus DSWs. Nevertheless, qualitative results were consistent between both groups indicating a need for a medication management program.

Summary of Environmental Scan

Methods

For the environmental scan, data was collected from the literature search by searching four health-related websites in NL and Canada: *The College of Registered Nurses of Newfoundland and Labrador (CRNNL) (2019)*, *The Institute for Safe Medication Practices (ISMP) Canada (2020)*, *Alberta Health Services (2022)* and *The College of Licensed Practical Nurses of Alberta (n.d.)*. These were the only websites which yielded resources that were applicable to unlicensed caregivers. These websites included information about medication

management such as important medication management tips, medication management programs, information about medication management practices, learning activities, and case scenarios about medication errors/medication management. Resources such as self-study medication management course and medication assistance program manual were also obtained from the literature search of these four websites, whereas case-based scenarios were obtained from consultations with the two local community-care agencies (*Blue Sky Family Care and Parallel Health*).

The information collected from community-care agencies was collected via email, as this was the preferred method by the director of both agencies (*Blue Sky Family Care and Parallel Health*). A questionnaire was emailed to the directors to ask them about their current medication management training (i.e., mode of delivery, content included, barriers, and resources). Any shared resources were able to be extrapolated to unlicensed caregivers and contained a variety of medication management information and educational strategies, which was pertinent to the development of my resource.

Environmental Scan Key Findings

The findings from the environmental scan (See Appendix D) were based on consultations with two local community-care agencies and resources pertinent to medication management in NL and Canada obtained from a literature search. There were three major themes identified through consultations: *theoretical and practical learning, classroom-based learning, and difficulty with online learning*. The training program for medication management aimed to integrate theoretical and practical learning for employees at both agencies. The current training emphasizes theoretical and practical aspects of medication management, providing employees with a well-rounded understanding of the subject. In-person learning was a mode of delivery

associated with each agency's medication management training, specifically for practical skills. For example, at *Parallel Health*, employees complete the theoretical component online and then meet with a nurse 1:1 to complete the practical skills (i.e., preparing, administering, and documenting medication). Difficulty with online learning was associated with the amount of time it takes to complete the online course, lack of insight into questions that are wrong on the medication quiz, and no access to a trainer/manager to ask questions.

There were four websites based in NL and Canada that had medication management resources available. In addition, *Blue Sky Family Care* shared two resources that are currently being used in their medication management training. There were two main themes associated with the literature and community-care agency resources: **educational strategies and lecture content**. Varieties of educational strategies were used in several resources (i.e., lecture, case-based scenarios, and quizzes) to make learning interactive and fun. Furthermore, all the resources shared important information related to medication management (i.e., rights of medication administration, documentation, storage) that should be included in lecture content before practical skills are completed.

Summary of the Resource

The medication management resource is a half-day workshop designed for DSWs (See Appendix E). A half-day workshop was an effective way to plan in-person training as consultations revealed this was the most preferred mode of delivery for training among this population. When participants were asked how they would like to learn about medication management, the most common responses were in-person and practical training. In addition, three studies promoted the use of a one-day medication management workshop for front-line employees (Dyer & Holmes, 2013; Siva, 2014; Thomas et al., 2021). Various learner

characteristics need to be considered for participants who will be completing this workshop. For instance, DSW experience ranges from less than one year to 15+ years, and education levels vary from high school diploma to master's degree. In relation, there are some differences in ethnicity (i.e., white, African American). Due to the large variance in learner characteristics, the program was tailored to the population to ensure it was basic, but informative.

Workshop Preparation

The workshop should take place in a training room or classroom that provides sufficient space for hands-on practical skill training with mannequins. As many of the educational strategies used in the training require interaction with others and feedback/supervision from the instructor, there is a maximum of 12 participants and a minimum of four participants per session. All DSWs will be required to complete the workshop. The training manager will keep track of DSWs who have completed the workshop and will be responsible for notifying DSWs when they are registered for a session. The training manager will send the class roster to the instructor. The instructor should be a nurse or another professional with a clinical background. The workshop is expected to last approximately 3.5 hours, including a 20-minute break and a 10-minute break throughout. The instructor should review the resource manual and the PowerPoint for the workshop before each session. The program consists of theoretical and practical content, which is taught using various educational strategies. Using various educational strategies targets the principles of Knowles' (1978) adult learning theory, which indicates that not all adults learn the same way. The resource manual describes these activities in detail for the instructor.

Introductions/Pre-Test

The workshop begins with an introduction to the instructor, the workshop, and participants. An icebreaker activity is used to make introductions fun and interactive. After

introductions, participants complete a medication management pre-test questionnaire. The purpose of this pre-test is to assess the baseline knowledge of participants. The pre-test questionnaire consists of 10 multiple choice/true or false questions regarding medication management. Participants have approximately 10 minutes to complete the pre-test questionnaire, which will not be corrected until the post-test is completed. The decision to incorporate a pre and post-test in this context was informed by the insights derived from the existing literature. This will help evaluate the extent of improvement the workshop has on DSWs' learning outcomes in terms of medication management.

Lecture

Information obtained from the literature review and environmental scan was used to develop the PowerPoint slides (lecture), which will be used to deliver most of the theoretical content for the workshop. The use of a lecture is an important part of this workshop to ensure participants have baseline knowledge about medication management before engaging in practical skills. The lecture will take approximately an hour to be completed, and it includes content about medication management (i.e., define medication management, types of medication errors, proper storage, administration, and documentation). Throughout the lecture, the instructor will model important practical skills such as medication preparation, administration, and documentation. Participants are expected to apply theoretical knowledge to practice via critical thinking, problem solving, and practical skills. Many interventions for medication management found in the literature included a lecture and other educational strategies and noted statistically significant or positive impacts (Dubovi et al., 2017; Frye & Rushanan, 2023; Ganaden & Mitchell, 2018; Goodwin et al., 2022; Holland et al., 2013; Mariani et al., 2017; Sim et al., 2022; Vital & Nathanson, 2023). In relation, the environmental scan (i.e., consultations with key stakeholders)

revealed that a lecture is necessary for medication management training with unlicensed caregivers to provide them with baseline knowledge. A lecture supports Kolb's (1984) experiential learning theory, as learning from an instructor via lecture is considered one of the four cyclical processes learners must engage in: planning. In relation, Knowles' (1978) adult learning theory indicates that adult learners must have background knowledge of information that is being taught to determine if it is relevant to their practice.

Case Studies

Case studies are another educational strategy used in this workshop to allow DSWs to apply theoretical knowledge through critical thinking and problem-solving exercises. The literature review and consultations determined that the use of different educational strategies such as case studies was a critical component of learning for this population (Dubovi et al., 2017; Goodwin et al., 2022; Mariani et al., 2017; Vital & Nathanson, 2023; Wagner, 2022). In addition, the environmental scan revealed the use of case studies among other medication management programs (i.e., Blue Sky Family Care). The goal for using case studies is for DSWs to work in groups (3-4 people) to solve medication management scenarios. Once completed, one participant from each group reads their case study and answers aloud to receive feedback and promote additional learning. This takes approximately 30 minutes to complete. Case studies allow participants to engage in the thinking phase of Kolb's (1984) experiential learning theory. Furthermore, this activity allows participants to share knowledge from experience, which is a major component of Knowles' (1978) adult learning theory.

Simulation

The literature review revealed simulation as a common and statistically significant way to increase medication management knowledge (Dubovi et al., 2017; Mariani et al., 2017; Sim et

al., 2022; Vital & Nathanson, 2023). Similarly, consultations revealed that DSWs want more hands-on practice. Simulation is used in this workshop to give participants the opportunity to practice critical thinking, problem solving, and practical skills. DSWs will be divided into small groups (3-4 people) and each group is assigned a simulation scenario. The simulation scenarios are related to a client who is in 24-hour care and is due for medication. The purpose of the simulation scenarios is to give DSWs the opportunity to practice skills such as preparing (i.e., three checks), administering, and documenting medication. In addition, other components are added to the simulation scenario to make DSWs think critically as a group. For example, the client may refuse to take the medication or vomit after taking it. In these scenarios, DSWs will need to apply theoretical content to help them solve the issue and think critically. The instructor will provide feedback and ask questions to promote critical thinking and problem-solving skills as DSWs engage in the simulation. Simulations take approximately 40 minutes to complete. After simulations, DSWs complete a reflection exercise (approximately 10 minutes). This is a self-directed exercise designed to assist DSWs in reflecting on their simulation experience and identifying both strengths and areas for improvement. Simulations and reflection allow participants to engage in many components of Kolb's (1984) experiential learning theory such as doing and observing. Meanwhile, this activity promotes hands-on experience so participants can directly relate it to practice and focuses on learning via problem solving vs content-oriented, as indicated by Knowles' (1978) experiential learning theory.

Posttest/Workshop Evaluation

At the end of the workshop, DSWs will complete a posttest- questionnaire (approximately 10 minutes), which is the same as the pre-test questionnaire that was completed at the beginning of the workshop. Once this is completed, the instructor will read answers aloud

so participants can correct their pre and posttest. A comparison of the scores on both tests should be an indicator of how much participants learned. Participants will also have 5 minutes to complete an anonymous written evaluation form about the workshop. This will help determine the effectiveness of the workshop, as well as changes that need to be made. The instructor will collect written evaluation forms, as well as pre and posttests to use for workshop evaluation. Participants do not require a specific score to pass the workshop. All participants will be emailed a certificate of completion within 24 hours of completing the workshop.

Discussion of Advanced Nursing Practice (ANP) Competencies

Throughout this course, I had the opportunity to engage in three advanced practice nursing (APN) competencies: research, education, and leadership. All these competencies are important in nursing practice, especially when dealing with complex situations.

Research

As an advanced practice nurse, research involves commitment to generating, synthesizing, critiquing, and applying evidence (Canadian Nurses Association (CNA), 2019). Throughout this practicum course, I conducted a thorough literature review, participated in consultations, and performed an environmental scan. These activities collectively yielded a wealth of relevant research material for my chosen topic and significantly enhanced my research skills. I also critically appraised some of this research using different critical appraisal tools such as the Public Health Agency of Canada (PHAC) (2014) critical appraisal tool and the Lincoln and Guba (1986) framework for trustworthiness to determine if it was suitable to use in the development of my project. Moreover, I synthesized research and data gathered from various methods, including consultations and surveys, to derive meaningful insights from the results.

Finally, I had to determine which research findings and data were directly relevant to the development of my project.

Education

Education involves commitment to professional competence, as well as growth and learning for colleagues, clients, and families (CNA, 2019). The development of this practicum project was a professional learning experience that allowed me to apply the knowledge and skills learned throughout the master's program. Applying this knowledge to a change initiative project has increased my level of professional confidence and competence. The overall goal of this practicum project was to develop an educational resource for developmental support workers; thus, increasing growth and learning for colleagues, and consequently clients and families. A consultation plan was used to identify the learning needs of the organization. The literature was consulted to determine if similar learning needs were identified among other populations. Based on these findings, a plan for half-day medication management workshop was developed. This created an opportunity for more professional growth and development, as I had the opportunity to collaborate with others (i.e., environmental scan) and learn about the resources other organizations have used for medication management training.

Leadership

Leadership involves nurses who become leaders in their organization and promote change (CNA, 2019). In completing this practicum, I was able to apply theories of project and change management to develop a resource based on organizational needs. Additionally, I had the opportunity to identify an area where change was required and take steps to initiate change. When the workshop is implemented at Momentum, I will be a mentor in the introduction of this workshop; therefore, continuing my leadership competencies.

Next Steps

As implementation was not a requirement for this practicum project, one of the next steps would involve getting approval from the training manager to implement this workshop. I would provide background information about the project and review the resource manual with the training manager. This would provide an opportunity for discussion, feedback, and questions. Once approval is granted from the training manager, there would need to be discussions about possible instructors for the workshop, besides myself. The training manager is responsible for developing the annual training plan based on organizational needs, seeking out potential instructors, and ensuring employees are compensated for training. I am likely to serve as the primary instructor until other suitable instructors can be identified and acquainted with the workshop's content and instructions.

Conclusion

Medication management is an important aspect of client-centered care that must be considered by both public and private health care agencies. Through review of the related literature, consultations with DSWs and key stakeholders, and performing an environmental scan, it was determined that medication management is needed for DSWs at Momentum Developmental Support. These results were consistent with the literature, which revealed that unlicensed caregivers (i.e., DSWs) do not receive consistent medication management training. Consequently, client safety and client outcomes are not as optimal as they should be. The implication of these findings was a starting point for change within this organization. This change included the development of a half-day medication management workshop to support DSWs in the development of medication management skills and competence, thereby contributing to improved client outcomes.

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Appendix A: Literature Review

Development of a Medication Management Program for Developmental Support Workers

A Literature Review

Medication management is an essential part of health that helps ensure the safety of others (i.e., clients, patients). According to the College of Registered Nurses of Newfoundland and Labrador (CRNNL) (2019) medication management is a part of client-centered care and involves more than just the administration of medication, but instead a combination of knowledge, skill, critical thinking, and decision-making. There are various components to medication management such as training, quality assurance measures (i.e., ensuring rights of medication administration are followed, and proper storage and disposal of medications), documentation, and organizational factors (i.e., staffing levels) (Strube-Lahmann et al., 2022). However, if medications are not managed properly, there is a high risk of medication errors; therefore, posing a risk to patient safety (Godfrey et al., 2013). Despite the importance of medication management, medication errors are the most common mistake in health care that affect patient safety (Berland & Bentsen, 2017; Cheragi et al., 2013). Castaldo (2022) defines medication error as “any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in control of the health care professional” (p.1). While hospital and long-term care settings employ mostly licensed professionals (i.e, Registered Nurse [RN], Licensed Practical Nurse [LPN]), much of community care is delivered by unlicensed caregivers such as home support workers (HSWs), and developmental support workers (DSWs) (Burgdorf et al., 2022). Additionally, as the nursing shortage continues, there will be a need for more delegation of medication administration to unlicensed caregivers in the community setting (Shore et al., 2022). These two classifications of unlicensed caregivers are very similar, as they perform many of the same duties (i.e., assisting with activities of daily

living); however, DSWs receive additional training to work directly with individuals with intellectual disabilities (ID).

Whether licensed or unlicensed, errors and mistakes are an inevitable part of life (Gilbert & Jeong-ah, 2018). Although eliminating all medication errors is unrealistic, it is logical to consider the level of training and education required for caregivers to administer medications. Among licensed professionals there are many factors that contribute to medication errors such as education and training, organizational culture, reporting system, and management behavior (Vrbnjak et al., 2016). Meanwhile, Burgdorf et al. (2022) noted that a lack of training and knowledge is the most common reason for medication errors among unlicensed caregivers. Due to the various levels of education among this population, there needs to be a focus on creating standard medication management training and resources for these caregivers.

Many interventions have been implemented to improve medication management practices among licensed and unlicensed caregivers. However, the most common interventions were focused on education and training (Dubovi et al., 2017; Goodwin et al., 2022; Holland et al., 2013; Mariani et al., 2017; Vital & Nathanson, 2023), quality improvement (QI) training (Frye & Rushanan, 2023; Ganaden & Mitchell, 2018; Sim et al., 2022; Wagner, 2022), and medication reconciliation (Aiezza et al., 2021, Hron et al., 2015; Young et al., 2015; Stuijt et al., 2021). Overall, most authors of the above-mentioned studies found statistically significant results between medication education and training, QI training, and medication reconciliation and medication management among nursing students and nurses.

While all these interventions reported some statistically significant impacts, education and training interventions have the most statistically significant results. Based on the literature, my project will involve the development of a medication management education program for

DSWs. Despite the evidence indicating that education and training interventions are effective, there are several gaps in the literature such as the best mode of delivery for a medication management program, and a lack of theoretical frameworks to guide these interventions. To address the mode of delivery gap, my program will be delivered using a half-day workshop and a variety of educational strategies that were used in the literature (i.e., simulation, lecture, problem-based learning). Consultations with DSWs and managers at Momentum Developmental Support revealed that employees prefer classroom-based training using a variety of educational techniques (i.e., hands on practice, discussion, lecture). Similarly, Goodwin et al. (2022) delivered medication management education using a two-day workshop with a variety of educational strategies; however, this workshop provided more in-depth content (i.e., intramuscular injections, recognizing and naming medications) than what is required for my target population. As a result, a half day workshop will be more appropriate for my program, as it is tailored toward the needs of the DSWs at Momentum. In addition, my program will be based on Kolb's experiential learning theory and Knowles' Adult Learning Theory.

According to Berland and Bentsen (2017), medication management in home care is not held to high standards. Godfrey et al. (2013) indicated that inconsistencies in medication training among unregulated care providers lead to ill equipped caregivers and decreased patient safety. Consequently, when caregiver training needs are not met, client needs are not met either. In fact, 1 in 3 unlicensed caregivers noted an unmet need for medication administration (Burgdorf et al., 2022).

Consistent with the literature, the medication management training available to unlicensed caregivers in the community setting in Newfoundland and Labrador varies within each organization. At Momentum Developmental Support, DSWs complete a basic medication

management training session during orientation (approximately 1 hour), which involves an online module and reviewing the medication management policy. However, there is no opportunity to practice hands-on or use critical thinking skills in relation to medication administration, which can contribute to an increased number of medication errors. According to Domm et al. (2021), critical thinking skills are essential in medication management to recognize when timely actions are needed to ensure safe and competent care.

As a result of the need for medication management training among unlicensed caregivers, I conducted an extensive literature review to determine the importance of medication management in health care. Additionally, through this literature review, I examined strategies or interventions that can be used to provide effective medication management training. To ensure consistency with the literature, the terms patient and client are used interchangeably throughout this literature review to indicate a consumer of health care. Furthermore, the term caregiver used throughout this literature review refers to any licensed or unlicensed health care provider (i.e., RN, LPN, HSW, DSW).

Literature Review Methods

For this literature review, the following databases were used: Cumulative Index to Nursing and Allied Health (CINAHL), PubMed, Cochrane library, and Google Scholar. Grey literature was also obtained from google and government websites. Quantitative and qualitative research studies published in English only were included in this review. The following key words were used: *“direct support professional”, “medication management”, “impact of medication errors”, “training programs”, “unlicensed caregiver”, “nurse”, “home support worker”, “medication error”, “workshop”, “education”, and “strategies”*. Limits for this literature review consisted of articles published in peer-reviewed journals and dated 2013-2023, with the exception of literature

used to describe theories. The quantitative research studies were critically appraised using the Public Health Agency of Canada (PHAC) critical appraisal toolkit (2014). The qualitative research studies were critically appraised using the Lincoln and Guba (1985) framework for trustworthiness. A literature summary review table was used to summarize some of the discussed studies (see Appendix B).

Literature Review

This literature review provides an overview of the prevalence of medication errors, common types of medication errors, and contributing factors. In addition, this review also examines the impact of medication errors on client safety, the healthcare system, and caregivers. Furthermore, strategies and interventions that can be used to improve medication management practices are discussed, as well as my proposed intervention to improve medication management among DSWs.

Medication Errors

Medication errors are a prevalent issue worldwide that can be prevented with proper medication management skills. According to Assiri et al. (2018), a medication error is a preventable event that results when medications are not managed properly, which may lead to inappropriate medication use or patient harm. Godfrey et al. (2013) indicated that medication management is a complex process that contributes to patient safety. This involves monitoring, reconciliation, documentation, and administration skills to ensure patients achieve desired outcomes. When components of the medication management process are not followed diligently, these can be contributing factors to the occurrence of medication errors.

Incidence and Prevalence of Reported Medication Errors

Although medication management is a prevalent issue globally, there is very limited literature available that examined the prevalence of medication errors among different countries. However, there was some literature related to the prevalence and incidence of medication errors worldwide, as well as in the United States (US), Canada, and Newfoundland and Labrador (NL).

According to the World Health Organization (WHO) (2022) approximately 237 million medication errors occur annually in Europe, and 66 million of these are deemed clinically significant. Two high-quality systematic reviews (Alshehri et al., 2017; Assiri et al., 2018) and a medium-quality cross-sectional study (Rasool et al., 2022) examined the prevalence of medication errors worldwide. A medication error rate of 2% to 94% was noted among these studies, with 5% to 41.3% of these medication errors related to hospital admissions, and 22% related to readmissions after discharge.

In comparison, McDade (2023) and the U.S. Food and Drug Administration (FDA) (2019), noted that medication errors are one of the most common errors in health care with approximately 100,000 to 400,000 medication errors reported annually in the US. This results in approximately 7000 deaths, consequently making medication errors the third leading cause of death in the US (Makary & Daniel, 2016). A high-quality literature review (James 2013) and systematic review (Ferrah et al., 2017) determined the prevalence of medication errors among several long-term care homes in the US. A medication error rate of 13-31% was noted among several long-term care homes, with an ADE rate of 1.2-7.3 per 100 resident months. The severity of these errors was classified as mild (42-60%), moderate (3-36%), and severe (0-1%) In addition, these medication errors resulted in an unplanned hospitalization rate of 3951 per 100,000 person years.

In Canada approximately 7531 medication incidents were reported from 2015-2020 among long-term care, hospitals, community pharmacy, and home/community care (The Institute for Safe Medication Practices [ISMP], 2020). The top two medications that involved medication errors were insulin (459 incidents) (6.1%), and hydromorphone (447 incidents) (5.9%), which are considered high alert medications. Similarly, the Canadian Institute for Health Information (CIHI) (2016) reported that the three most common drugs that lead to medication errors are insulin (9%), hydromorphone (7%), and heparin (4%). In relation, one fifth (19%) of Canadian nurses acknowledged making occasional or frequent medication errors for patients in their care over a one-year period (Statistics Canada, 2015). Although there are not a vast range of statistics for Canada, the literature that is available suggests that medication errors are an issue in this country.

While there is limited data about the prevalence rates of medications errors in NL, a medium-quality cross-sectional study by O'Brien et al. (2013) reported an increase in medication errors in Western Newfoundland during transition (transfer from hospital to long-term care) of elderly patients to the new long-term care. The rate of medication errors per 1000 resident days were as follows: pre-transition (1.1), transition (2.7), and post-transition (1.5).

Despite the fact that literature about the prevalence of medication errors is limited in some countries, the literature that was available clearly indicates that medication errors are an issue.

Contributing Factors to Medication Errors

There are many different individual and organizational factors that contribute to medication errors. Examining these factors can promote awareness and ensure effective strategies are implemented to reduce these factors. As a result, this can decrease medication

errors and improve patient safety. Three qualitative descriptive studies (Ali et al., 2021; Bengtsson et al., 2021; Castaldo, 2022), three medium-quality cross-sectional studies (Hammoudi et al., 2018; Wondmieneh et al., 2020; Yousef et al., 2021), and one high-quality systematic review (Dionisi & Di Simone, 2022) identified common individual and organizational contributing factors for medication errors.

Individual Factors

One of the most common individual contributing factors identified was lack of knowledge and training (Ali et al., 2021; Bengtsson et al., 2021; Castaldo, 2022; Wondmieneh et al., 2020; Yousef et al., 2021). When caregivers did not receive adequate medication training, medication management skills were not based on best practice guidelines. As a result, this caused an increased number of medication errors. Furthermore, unclear communication was noted to be a contributing factor that caused distress among caregivers (Ali et al., 2021; Bengtsson et al., 2021; Dionisi & Di Simone, 2022; Hammoudi et al., 2018; Yousef et al., 2021). Many caregivers reported feeling inferior to some members of the team (i.e., physicians) due to futile communication. Consequently, some caregivers did not seek assistance or ask for clarification when needed which contributed to increased medication errors and healthcare costs. Meanwhile, stress was another common contributing factor that caused caregiver burnout and fatigue (Ali et al., 2021; Bengtsson et al., 2021; Castaldo, 2022; Dionisi & Di Simone, 2022; Yousef et al., 2021). This had an impact on the quality of care that caregivers were able to provide and increased the chances of a medication error being made. In addition, caregiver mental health was also affected.

Organizational Factors

Workload was one of the most common organizational factors contributing to medication errors among licensed and unlicensed caregivers (Ali et al., 2021; Bengtsson et al., 2021; Castaldo, 2022; Dionisi & Di Simone, 2022; Hammoudi et al., 2018; Yousef et al., 2021). Increased workload resulted in increased stress and missed tasks for caregivers which often resulted in medication errors. In addition, many caregivers who made a medication error due to increased workload reported needing time off for mental health, which also increased healthcare costs. In relation, interruptions during medication administration were another contributing factor that caused caregivers to become distracted during medication preparation; therefore, missing important steps such as the double check principle (Ali et al., 2021; Bengtsson et al., 2021; Castaldo, 2022; Wondmieneh et al., 2020; Yousef et al., 2021). This often resulted in an increased number of medication errors and ADEs. Finally, a lack of clear guidelines/policies was also an organizational contributing factor (Bengtsson et al., 2021; Castaldo, 2022; Dionisi & Di Simone, 2022; Hammoudi et al., 2018). When clear guidelines/policies were not implemented, care was provided based on various levels of knowledge and experience. As a result, medication management practices were not consistent and caused increased medication errors, as well as increased healthcare costs due to these errors.

In conclusion, there are three common individual (lack of knowledge and training, unclear communication, and caregiver burnout and fatigue) and organizational factors (workload, interruptions during medication administration, and lack of clear policies and guidelines) that contribute to medication errors. These contributing factors are similar for unlicensed and licensed caregivers and can contribute to several different types of medication errors.

Types of Medication Errors

Three medium-quality cross-sectional studies, two high-quality systematic reviews, and one medium-quality retrospective case-control study identified three common types of medication errors which are wrong dose, wrong time, and wrong medication. The first type of medication error was related to wrong dose (Blignaut et al., 2017; Cheragi et al., 2013; Choi et al., 2016; Keers et al., 2013; Parand et al., 2016; Wondmieneh et al., 2020). Caregivers who reported a wrong dose medication error noted that interruptions and patient acuity level was associated with this type of error, as well as lack of pharmacological knowledge. Meanwhile, wrong time was the second most common medication error (Blignaut et al., 2017; Choi et al., 2016; Hammoudi et al., 2018; Keers et al., 2013; Parand et al., 2016; Wondmieneh et al., 2020). High patient workload and shortage of staff were often associated wrong time errors, as caregivers reported feeling overwhelmed with their caseload and not having adequate time to provide quality care. The last commonly reported type of medication error was related to wrong medication (Choi et al., 2016; Parand et al., 2016; Wondmieneh et al., 2020). Individual and organizational factors were associated with this type of error, as some studies reported factors such as stress and lack of knowledge, while others reported inconsistent policies and unclear interdisciplinary communication.

Similarly, at Momentum Developmental Support, most medication errors are related to wrong dose, wrong time, and wrong medication. Although the medications are in blister packs at this agency, many errors occur when DSWs detach the wrong blister; therefore, resulting in clients receiving the wrong medication and dose at the incorrect time.

While there are many types of medication errors, these three common ones that reoccur in the literature. Many of the contributing factors associated with these errors were related to the

common factors identified such as lack of knowledge and stress. These types of medication errors were also similar among licensed and unlicensed caregivers.

Unreported Medication Errors

Unreported medication errors can have an impact on the actual prevalence and incidence rate of medication errors. Data collected to determine prevalence and incidence of medication errors is typically extracted from incident reports (Westbrook et al., 2015). Incident reports are a tool used to report events (i.e., medication errors or near misses) that may have harmed a patient or had the potential to harm a patient (Mitchell et al., 2016). However, incident reporting is influenced by many barriers and facilitators; therefore, it may be difficult to provide an accurate number of the incidence and prevalence of these errors. A medium-quality cross-sectional study by Westbrook et al. (2015) confirmed this through direct observation of 180 nurses who administered 7451 medications in total. Through these observations, it was noted that 2043 medication administrations had ≥ 1 error; however, none of these errors had been reported. There are several facilitators for incident reporting such as open communication, constructive feedback, non-punitive actions, teamwork, and transactional or transformational leadership (Frag & Anthony, 2015; Frag et al., 2017). Meanwhile, common barriers to reporting include fear of judgement, blame, or retaliation, workplace culture, reporting system, and lack of time (Castaldo, 2022; Vrbnjak et al., 2016).

While there are already many alarming statistics for medication errors, being aware of factors that facilitate incident reporting can help ensure caregivers feel comfortable reporting when necessary; therefore, providing an accurate representation of these data.

Medication Errors Among Healthcare Workers

Medication errors are common among all healthcare workers who have the ability to administer medications, whether licensed or unlicensed. This section will discuss the rates of medication errors, as well as contributing factors among licensed versus unlicensed caregivers.

Unlicensed Caregivers

An unlicensed caregiver is considered a paraprofessional who can assist individuals with healthcare needs. These caregivers don't typically require a higher level of education (i.e., university degree); therefore, certain skills such as medication administration require supervision or delegation by a licensed professional (i.e., HSW, DSW) (Godfrey et al., 2013). Erickson et al. (2020) noted that many unlicensed caregivers have reported not understanding the complex drug regimens for those with ID, which means these individuals are particularly at risk for medication errors. In fact, individuals with ID have a higher percentage of hospital admissions due to ADE than the general population (1.61% vs 0.7%) (OR=2.47) (Erickson et al., 2020).

Two high-quality systematic reviews (Godfrey et al., 2013; Parand et al., 2016) and a medium-quality cross-sectional study (Stube-Lahmann et al., 2022) examined medication errors among unlicensed caregivers working in home care. Godfrey et al. (2013) and Parand et al. (2016) reported a medication error rate of 12% to 92.7% among unlicensed caregivers, with dosage error being the most common. In relation, education and knowledge regarding medication was considered a major contributing factor for many of these errors. In comparison, Strube-Lahmann et al. (2022) noted a medication error rate of 41.6% in a 12-month period among 107 home care services. Many of the errors that occurred in these settings were due to failure to comply with the double check principle.

Licensed Caregivers

A licensed caregiver is a professional who must complete required academic training before becoming licensed to practice independently (i.e., RN, LPN) (Al-Jumaili, 2017). Two medium-quality cross-sectional studies (Blignaut et al., 2017; Cheragi et al., 2013), a medium-quality observational study (Choo et al., 2013), and a high-quality literature review (Al-Jumaili, 2017) examined medication errors among licensed caregivers. Blignaut et al. (2017) and Cheragi et al. (2013) revealed a medication error rate of 65.55% to 94% among licensed caregivers. In addition, there was a near miss rate of 31.37%. Lack of pharmacological knowledge, excessive workload, interruptions (i.e., phone ringing, taking orders from a physician, and patient acuity) were the main causes of these errors. In fact, there was a statistically significant relationship between wrong dose errors and interruptions (OR=2.56) ($p<0.05$), and wrong dose errors and patient acuity (OR=10.55) ($p<0.05$). Deviation from safe medication practices (i.e., no patient identification) was also a contributing factor in 75-100% of medication errors. Choo et al. (2013) reported that 90% of nurses were distracted during medication administration and 5024 errors occurred due to non-compliance with medication procedures. In contrast, Al-Jumaili (2017) noted an ADE rate of 1.89 to 10.9 per 100 resident-months in nursing homes with unlicensed and licensed caregivers. Again, the most common reason for medication errors was related to staff knowledge.

Developmental Support Workers

There have not been any studies conducted that examined the prevalence of medication errors among DSWs directly. However, in 2022, at Momentum Developmental Support, DSWs participated in a needs assessment via an online survey regarding the current training plan. Through this assessment it was determined that 73% of employees were not satisfied with the current online medication management module delivered via the online learning system named

Practicare. In relation, 65% of employees reported that they require more medication management training (i.e., proper procedures for preparing, administering, and documenting medication), and they would prefer this training to be in-person (80%). The results of this needs assessment were not surprising based on the increased number of medication error incident reports the organization had been receiving. These findings are consistent with the literature which indicate that more medication training is required in this setting, especially for caregivers who assist those with ID.

Impact of Medication Errors

Medications errors typically result from poor medication management practices (Blignaut et al., 2017). As such, the consequences of medication errors do not just impact one aspect of the healthcare system. In this section, I discussed the impact of medication errors on clients, healthcare costs, and caregivers.

Clients

Adverse Drug Events

Client safety is one of the most important health-related outcomes. When medications are not managed properly, the risk of medication errors increase, consequently impacting client safety. Preventable ADEs are one of the most common consequences of medication errors (Iwasaki et al., 2021). According to Wolfe et al. (2018), a preventable ADE is a drug event that is caused by medication errors such as omission, incorrect dose, time, or medication. Two medium-quality cross-sectional studies (Burgdorf et al., 2022; Mayahara et al., 2014), a medium-quality case-series (Levkovich et al., 2022) and a high-quality systematic review (Assiri et al., 2018) examined the relationship between medication errors and ADEs.

Burgdorf et al. (2022) examined the prevalence of ADEs among sepsis survivors which were related to unmet caregiver needs, while Mayahara et al. (2014) focused on the relationship between ADEs and caregiver adherence to PRN (as needed) medication regime. Burgdorf et al. (2022) found statistically significant differences in sepsis survivors who experienced an ADE versus sepsis survivors who did not, such as increased impairment in cognitive function (86% vs 79%, $p < 0.001$), increased need for medical procedures/treatment (79% vs 75%, $p < 0.001$), required additional medical equipment (86% vs 84%, $p < 0.001$), and increased supervision and monitoring (89% vs 86%, $p < 0.001$). Mayahara et al. (2014) found that clients who experienced an ADE related to caregivers not adhering to administering the analgesic PRN regime had a mean pain score of 0.37 ($p \leq .001$). Additionally, PRN analgesic medication errors were associated with higher levels of pain ($p = 0.046$). The most common error was giving a sedative instead of an analgesic which resulted in a significantly higher pain level ($p = 0.024$). In comparison, Levkovich et al. (2022) determined the incidence and prevalence of medication emergency team (MET) activations associated with ADEs. Several consequences of MET activations for ADEs such as tachycardia due to omission of beta-blocking agents (10.9%), hypotension from cumulative toxicity (9.8%), and inappropriate use of antihypertensives (10.9%). Moreover, Assiri et al. (2018) investigated the prevalence of medication errors and ADEs among adults in various healthcare settings. Many consequences of ADEs were revealed such as emergency room (ER) visits, hospitalization, and increased outpatient visits. In addition, patients taking more than seven medications (OR=3.3) and >80 years old (OR=4.4) had an increased risk of ADEs.

In summary, medication errors have the potential to cause serious harm to patients. According to the CIHI (2016), there have been many gaps over the years in measuring harm;

however, Canadian hospitals are currently collaborating to determine how to address these gaps and ensure there are improvements made for patient safety. While the current literature lacks specific details about the effects of such errors (e.g., fall, seizure), it is likely that future research will provide these details after addressing the measuring harm gap.

Length of Hospital Stay

Four medium-quality studies determined the impact of medication errors on length of hospital stay (LOS) (McCarthy et al., 2017; Moore et al., 2022; Schlosser et al., 2020; Zheng et al., 2022). McCarthy et al. (2017) used a case control design, while Moore et al. (2022) completed a retrospective observational study. In addition, Schlosser et al. (2020) conducted a retrospective analysis, and Zheng et al. (2022) conducted a randomized controlled trial (RCT). McCarthy et al. (2017) determined the impact of three classes of medications in relation to medication errors and LOS. Meanwhile, Moore et al. (2022) examined the relationship between implementation of a nurse specialist for medication coordination and LOS for patients with Parkinson's. Schlosser et al. (2020) examined the use of post-operative opioid use in relation to medication errors and LOS, and Zheng et al. (2022) determined the impact of medication reconciliation on medication errors and LOS for patients undergoing orthopedic surgery.

McCarthy et al. (2017) noted three main classes of drugs associated with medication errors: chemotherapy (38%), corticosteroids (14%), and opioids (11%). The LOS (days) for the case group (did experience a medication error) versus control group (did not experience a medication error) for each class of drugs were as follows: chemotherapy (5.0-11) vs (4.0-7.0) ($p=0.005$), corticosteroids (4.0-7.8) vs (3.7-5.3) ($p=0.235$), opioids (4.8-16.0) vs (4.2-7.2) ($p=0.251$). Chemotherapy was the only drug class noted to have a statistically significant result. In comparison, Moore et al. (2022) found that the implementation of a nurse specialist to

coordinate medications for patients with Parkinson's led to less medication errors and therefore reduced LOS over a period of five years. The results for LOS in 2010, 2014, and 2015 were as follows: 2010 (24 days), 2014 (12 days), 2015 (9 days). Schlosser et al. (2020) reported statistically significant results which indicated that lower doses of morphine milligram equivalent (MME) were associated with decreased risk of medication errors and decreased LOS ($p < 0.001$). Those who received lower MME also had an increased chance of being discharged 1-day post-op due to decreased medication errors versus those who had higher doses of MME (41.2% vs 19.6%). Additionally, there was a 15.3% reduction in readmission rates for ADEs related to medication errors for those who had lower MME. In relation, Zheng et al. (2022), reported 506 medication discrepancies found among 260 patient charts when medication reconciliation was completed. Statistically significant results were reported for those who received medication reconciliation. There was a reduced mean LOS (days) related to decreased medication errors for those who received medication reconciliation versus those who did not receive medication reconciliation (16.3 vs 20.7) ($p = 0.03$). In addition, there were no readmissions among those who received medication reconciliation, compared to three readmissions for those who did not receive medication reconciliation. A shortened time between first admission and reimplantation of a new prosthesis was noted among those who received medication reconciliation (due to decreased medication errors and risk of complications) versus those who did not (57.3 days vs 70.5 days, $p = 0.002$).

To conclude, medication errors have been shown to have a significant impact on LOS among hospitalized patients. This is due to the fact that there are often complications (i.e., ADEs) that happen as a result of medication errors. Consequently, this increases the acuity of care, and often requires a longer LOS.

Healthcare Costs

The cost of healthcare in Canada continues to increase annually (CIHI, 2022). In fact, this is the consensus for worldwide healthcare. Medication errors often lead to increased emergency room visits, hospital visits, or longer length of stay; therefore, increasing healthcare associated costs (Elliott et al., 2021). Healthcare costs throughout the literature were associated with LOS/hospitalization and treatment.

Three medium-quality cross-sectional studies (Shamliyan and Kane, 2016; Sim et al., 2022; Slight et al., 2018), a medium-quality retrospective observational study (Moore et al., 2022), a medium-quality retrospective case-control (Choi et al. (2016), and a medium-quality retrospective cohort study (George et al., 2021) examined costs associated with medication errors. Shamliyan and Kane (2016) examined drug harm in Medicare beneficiaries from 2000-2008, while Sim et al. (2022) evaluated the implementation of a patient safety strategy as part of a QI project from 2012-2016. Slight et al. (2018) estimated the cost of ADEs in US hospitals from overriding medication alerts. Moore et al. (2022) examined the relationship between implementation of a nurse specialist for medication coordination and cost of LOS for patients with Parkinson's. Moreover, Choi et al. (2016) estimated treatment costs associated with medication errors in two US hospitals from 2005-2006, while George et al. (2021) examined the impact of ADEs on health care resource utilization and costs among patients treated with immune checkpoint inhibitors.

Shamliyan and Kane (2016) found that the cost of healthcare hospitalizations due to ADEs increased from \$9 billion in 2000 to \$44 billion in 2008. Furthermore, anticoagulants, cardiovascular drugs, hormones, analgesics, and systemic agents were considered the top medications associated with medication errors and ADEs among nurses, where treatment costs

were greater than \$1 billion. Results for LOS were for in-hospital ADE were reported to be statistically significant, as they were greater than ADEs that occurred outside of hospital (6.5 vs 5.6, respectively; $p < 0.0001$). In comparison, Sim et al. (2022) noted findings that indirectly demonstrate the financial impact of medication errors on healthcare costs. Due to the implementation of the patient safety strategy, ADE rates decreased from 11.6% to 5.4% ($p = 0.017$), which was statistically significant. This also resulted in a cost savings of 20,600 bed days and \$29.2 million US. Meanwhile, Slight et al. (2018) found that the most common medication alerts were drug-allergy, drug-drug interaction, duplicate drug, and drug dosing. Of 78.8 million medical alerts in US hospitals in 2014, approximately 5.5 million were inappropriately overridden. This resulted in 196,600 ADEs, consequently costing the health care system between \$871 million to \$1.8 billion.

Moore et al. (2022) revealed that implementation of a nurse specialist to oversee medication coordination can decrease medication errors; therefore, decreasing LOS and costs associated with LOS. The mean LOS for 2010, 2014, & 2015 were as follows: 24 days, 12 days, and 9 days, respectively. The mean costs per patient associated with each LOS was \$9190.32, \$4595.16, \$446.37, respectively. Meanwhile, the mean costs for LOS for 30 patients based on these averages were \$275,709.60, \$137,854.80, \$103,391.10. As implementation of the nurse specialist became more prevalent throughout the years, medication errors and LOS decreased, saving the healthcare system thousands of dollars. Moreover, Choi et al. (2016) indicated that treatment costs associated with medication errors were noted to range from \$8439-\$8898 among two US hospitals. George et al. (2021) reported that patients who experienced an ADE had double the risk of an inpatient stay (hazard ratio-2.2) and 80% higher risk of an emergency room visit (hazard ratio-1.8) than patients who did not experience an ADE. The 6-month total costs for

LOS were considered statistically significant as results indicated that LOS was higher among patients with an ADE versus those without an ADE (\$99,037 vs \$74,736, respectively) ($p < .001$). In addition, ADE-related treatment costs averaged $\$2359 \pm \7496 per patient per month, with 89.9% of these costs related to in-patient visits.

In conclusion, medication errors have been shown to have an impact on healthcare costs associated with LOS/hospitalization and treatment. Increasing medication management skills among caregivers will help decrease medication errors, consequently, this can be a starting point to decrease healthcare costs worldwide.

Caregivers

Although it is not commonly discussed, medication errors can have devastating and long-lasting impacts on caregivers (Athanasakis, 2019). This includes the impact on mental health and self-confidence.

Mental Health

Mental health is an important aspect of an individual's overall well-being. Caregivers are often exposed to many stressors in the work environment that can impact mental health. According to Bobbette et al. (2022), 1 in 3 workers who support people with ID report moderate to severe stress at work. Medication errors are one of the major stressors in healthcare. The impact on mental health is so significant that caregivers are often referred to as second victims of these errors (Robertson & Long, 2018).

Three qualitative research studies (Athanasakis, 2019; Kuppadakkath et al., 2022; Morrudo Garcia et al., 2019) and one medium-quality cross-sectional study (Treiber & Jones, 2018) examined the impact of medication errors on caregiver mental health. Athanasakis (2019) conducted a meta-synthesis, Kuppadakkath et al. (2022) used a phenomenological design, and

Morrudo Garcia et al. (2019) used a descriptive exploratory design. Athanasakis (2019) and Kuppadakkath et al. (2022) explored nurses' lived experiences of medication errors, while Morrudo Garcia et al. (2019) examined the consequences of drug therapy errors from a nursing point of view. In comparison, Treiber and Jones (2018) determined the impact of second victim syndrome on nurses.

Athanasakis (2019) identified two main themes associated with nurses' mental health and medication errors: moral impact and emotional impact. Many nurses felt morally impacted when they had to decide to report or not report their medication error; therefore, compromising their career. In addition, many nurses reported feelings of guilt and felt their professional identity had been impacted. The emotional impact was associated with feelings of fear (most common), anger, stress, panic, and trauma. As a result of the emotional impact, symptoms such as depression, insomnia, nightmares, post-traumatic stress disorder (PTSD), and thoughts of suicide were reported. Similarly, one of the main themes that emerged from Kuppadakkath et al. (2022) was the psychological impact on individual nurses, coworkers, patients, and families. It was noted that many nurses had difficulty engaging in their role after a medication error and felt frustrated and emotionally stressed. Furthermore, the pressure and stress of making a medication error made many nurses leave their job, causing staff attrition. Patients and families reported feelings of distress and dissatisfaction with care which also impacted nurses' mental well-being.

In addition, Morrudo Garcia et al. (2019) reported several impacts on individual mental health such as administrative proceedings (dismissal, verbal, and written warnings), withdrawal from work for training, and many emotional consequences such as fear, shame, and uncertainty. One of the major impacts to mental health was exposing individuals who made a medication error to the entire team. Treiber and Jones (2018) found that over half (56%) of participants had

reported making at least one medication error. The most common errors were incorrect dose, and incorrect drug. Many strong emotional responses were associated with these errors such as fear, anger, frustration, and disappointment. Visceral symptoms such as vomiting were also reported with these emotions.

In summary, medication errors have a negative impact on caregiver mental health. While medication errors are not intentional, this does not eliminate the valid feelings that caregivers experience when a medication error is made. Many of these impacts are not noticeable, such as decreased self-confidence.

Self- Confidence

Two medium-quality cross-sectionals (Melnyk et al., 2018; Quillivan et al., 2016), a high-quality systematic review (Seys et al., 2013), and a qualitative descriptive study (Mahat et al., 2022) were used to determine the relationship between medication errors and self-confidence. Melnyk et al. (2018) examined the relationship between caregiver health and medication errors, while Quillivan et al. (2016) assessed the influence of patient safety culture on second victims. In relation, Seys et al. (2013) determined the impact of adverse events on second victims. Furthermore, Mahat et al. (2022) discussed the negative emotions experienced by health care staff after a medication error.

In their cross-sectional study, Melnyk et al. (2018), asked participants to complete the professional quality of life scale. Questions on this Likert scale included items related to self-confidence, productivity, and feeling worn out such as “I am not as engaged with my patients today as I used to be”, and “I believe I can make a difference through my work”. Items were rated 1 (never) to 5 (very often), with a higher total score indicating a higher professional quality of life and increased self-confidence. Out of 1790 nurses who made medication errors, 56.04%

had a score of 0-11 on this scale, indicating a low professional quality of life, and decreased self-confidence. Quillivan et al. (2016) indirectly found an association between decreased professional self-confidence and medication errors. It was noted that poor patient safety culture measures such as punitive responses to medication errors and a lack of organizational support after a medication error led to professional stress and decreased self-confidence. Two aspects of patient safety culture were assessed: non-punitive responses to medication errors and organizational support. It was reported that non-punitive responses to medication errors and organizational support were significantly associated with increased self-confidence ($p = 0.001$) ($p < 0.01$), respectively. In Seys et al. (2013), medication errors were determined to have an impact on caregivers' professional lives. *Several studies noted caregivers feeling personally responsible for the event which cause intense reactions and feelings of anguish. Additionally, caregivers were afraid of losing their self-confidence and feared that colleagues would think they delivered poor quality of care due to making a medication error.* In comparison, Mahat et al. (2022) revealed many negative emotions such as stress, which led to feelings of devastation. As a result, caregivers reported questioning their own competence, which also decreased their self-confidence.

The literature suggests that medication errors have a harmful effect on caregivers' self-confidence. While some of these studies indirectly measured the effect of medication errors on self-confidence, these results still provide valuable information that can be used to ensure effective resources are implemented to prevent decreased self-confidence after a medication error.

Summary of the Impact of Medication Errors

In conclusion, medication errors have been shown to have a significant impact on clients, healthcare costs, and caregivers. The most obvious impacts are those related to clients, such as ADEs and Length of Hospital Stay. As a result of the impact on clients, healthcare costs are also directly impacted. While the impact on caregivers is not as apparent, medication errors also have a long-lasting effect on caregiver's mental health and self-confidence. The impacts of medication errors can be prevented through several interventions such as medication training and education, QI training, and medication reconciliation.

Prevention of Medication Errors

Although medication errors can never fully be eliminated, they can be prevented with proper medication management skills. Healthcare organizations must ensure effective strategies and interventions are implemented to improve medication management practices. When safe medication management practices are reinforced, there is decreased risk of medication errors. This section will discuss potential strategies and interventions to address this issue such as medication training and education, QI projects, and medication reconciliation.

Medication Training/Education

The need for additional medication training and education is a common theme throughout the literature (Assiri et al., 2018; Burgdorf et al., 2022, Mayahara et al., 2014). Five studies examined the impact of medication management training and education on medication management skills and noted significant results. There were two high-quality randomized controlled trials (RCT) (Mariani et al., 2017, Vital & Nathanson, 2023), a medium-quality non-randomized controlled trial (NRCT) (Dubovi et al., 2017), a medium-quality mixed methods NRCT /phenomenological study (Holland et al., 2013), and a phenomenological study (Goodwin et al., 2022). Three different modes of delivery were used for these interventions including

simulation or simulation/lecture with case scenarios (Dubovi et al., 2017; Mariani et al. 2017; Vital & Nathanson, 2023), lecture and online video (Holland et al., 2013), and a workshop with lectures and case-studies (Goodwin et al. 2022).

Dubovi et al. (2017) evaluated the effectiveness of a virtual reality simulation for learning medication administration procedures. One group received virtual simulation for one semester, and the other group received normal lectures. A pre-test and post-test were completed by both groups at the beginning and end of the semester. Dubovi et al. (2017) noted a statistically significant difference in overall mean knowledge pre-and post-test scores between the group who received virtual simulation training (55 vs 93) versus normal lectures (51 vs 52) ($p < 0.001$). There was also a statistically significant difference noted between two subscales: medication administration sequence and basic procedural concepts. The mean pre and post-test scores for medication administration sequence were as follows: INT (32 vs 83), CT (38 vs 41) ($p < 0.001$). Additionally, the mean pre and post-test score for basic procedural concepts for the simulation group were 67 vs 98, and 65 vs 57 in the normal lecture group ($p < 0.001$, which was also considered statistically significant).

Mariani et al. (2017) examined impact of additional 1-1.25 hours of simulation training for nursing students based on the Jeffries Simulation Theory and the International Association for Clinical and Simulation Learning (INACSL) Standards of Best Practice. There were 43 students in the intervention group and 43 in the control group. Those in the intervention group received two simulation sessions (medication skills training, and two-person medication administration), while the control group only received one simulation session about medication skills training. Mariani et al. (2017), found a statistically significant difference between the number of students who passed the medication skills knowledge assessment in the group who

received two simulations (57%), compared to the group who only received one simulation (28%) ($p=.02$). Furthermore, the group with two simulations also scored significantly higher than the group with one simulation when between group scores for the medication safety critical element checklist were compared (70.4% vs 56.1%, $p=.028$).

Vital and Nathanson (2023) measured the impact of an interruption management strategy “Stay S.A.F.E” during medication administration with nursing students. One group received two educational PowerPoints: Stay S.A.F.E strategy and medication safety practices, while the other group only received the PowerPoint about medication safety practices. Students then participated in three simulations where they were interrupted during medication administration to measure the impact of the intervention. Similarly, Vital and Nathanson (2023) found that the group who received two PowerPoint presentations had a shorter median return time (secs) to primary task in simulation 2 versus the group who only had one PowerPoint presentation (11.9 vs 18.9, respectively) ($p=.007$). This was a statistically significant result. In addition, the INT group also showed statistically significant mean times for all three simulations (30.1 vs 12.4 vs 13.0) ($p<.001$). In addition, when interrupted by a nurse who wanted to give report, the group had received two PowerPoint presentations showed a statistically significant improvement in the percentage of nurses giving the appropriate response (not taking report) during simulation 2 and 3 (5.0% and 5.6%, respectively) ($p=.002$) ($p=.008$). There was also a statistically significant decrease in mean frustration scores across three simulations among this group (23.4 vs 19.3 vs 12.4) ($p=.034$).

Holland et al. (2013) evaluated the use of an online video for medication administration. The intervention group received standard teaching (lectures and skill classes) and unlimited access to an online video clip of medication administration, while the control group only

received standard teaching. Performance and satisfaction were measured using objective structured clinical examination (OSCE) and a satisfaction survey. There was statistically significant association between group and OSCE outcome, as the group who had access to the online video were more likely to pass the assessment, as opposed to the group without the video (79.2% vs 65.5 %, respectively) ($p= 0.021$). Based on the percentage of highly satisfied responses on the satisfaction survey, satisfaction levels were statistically significantly higher among the group who received the intervention, compared to the group who did not (48% vs 0%, respectively) ($p<0.05$) Furthermore, two major themes were identified: classroom learning and transfer to practice. Students noted that classroom learning was beneficial for learning from peers and the use of additional resources such as a video was beneficial as it could be used as a reference point. Group discussions were also a valuable learning strategy, and many students noted that learning the basics in the classroom helped them feel confident in practice.

In contrast, Goodwin et al. (2022) examined student nurses' views of a two-day medication workshop that involved several educational strategies such as lecture and problem-based learning. There was a total of 32 student nurses who participated in the study. Data was collected using focus groups. Three main themes were revealed among student nurses who participated in the medication workshop: developing confidence regarding medication management, reflections on learning, and enhanced awareness of medication errors. Many of the participants reported that the medication workshop helped them identify any knowledge deficits; therefore, improving their overall confidence with medication administration. In relation, it also helped participants improve communication between other healthcare providers. When reflecting on learning gained from the workshop, participants noted that the workshop was a fun way to learn and help them apply learning to practice. Students also liked how the workshop contained

practical and theoretical learning material. Furthermore, many students reported an increased awareness of medication errors and noted that this workshop helped reduce the stigma associated with making an error. Finally, participants reported increased confidence in the ability to report a medication error. Overall, the medication management workshop was noted to have a positive impact on student confidence and competence related to medication management.

All studies reported either statistically significant differences or positive feedback related to medication management education and training. Furthermore, these studies used a variety of educational strategies to deliver the medication management content such as simulation, lectures, group discussion, videos, and a workshop. Three of studies used simulation or simulation/lecture with problem-based learning as an educational strategy and noted statistically significant results associated with these strategies and medication management knowledge (Dubovi et al., 2017; Mariani et al., 2017; Vital & Nathanson, 2023). In comparison, Goodwin et al. (2022) used a workshop that involved lecture and problem-based learning reported positive experiences associated with this workshop. Additionally, Holland et al. (2013) only used a lecture but found statistically significant results between the use of lecture and medication management knowledge. As a result of the statistically significant results/ positive feedback associated with these educational strategies, lecture, simulation, and problem-based learning will be implemented into my program.

Jie-hui (2016) indicated that simulation is a beneficial educational strategy for healthcare professionals as it provides a realistic clinical environment where learners can integrate knowledge, skills, and critical thinking. Meanwhile, Pan et al. (2018) reported that problem-based learning is important in health care, as it helps participants face the practice-learning gap, and encourages active learning through reflection, teamwork, problem-solving skills, and the

integration of knowledge. In addition, Aloush (2019) noted that when lectures are used as an educational strategy in health care, there should be a focus on the need-to-know elements which will help foster decision-making skill. The use of these strategies is consistent with Knowles' adult learning principles which indicate that everyone learns differently, and adults learn best through sharing experiences (Knowles, 1978). Additionally, the use of methods such as simulation and problem-based learning give participants the opportunity to practice hands-on learning, reflection, and planning which is related to the experiential learning theory (Kolb, 1984). As a result, education and training sessions about medication management have been shown to be effective and can be based on learning theory.

Quality Improvement Projects

QI projects are an important part of reorienting healthcare processes and improving patient outcomes. According to Wagner (2022), QI projects associated with medication administration help healthcare professionals develop critical thinking, reasoning, and prioritization skills. Three medium-quality studies (Frye and Rushanan, 2023; Ganaden and Mitchell, 2018; Sim et al., 2022) and one moderately trustworthy study (Wagner, 2022) examined the impact of QI projects in relation to medication management. Frye and Rushanan (2023) and Ganaden and Mitchell (2018) used an uncontrolled before after (UCBA) design, while Sim et al. (2022) used a cross-sectional, and Wagner (2022) used a qualitative descriptive design. Four different modes of education were used in the QI projects including a 1-hr online module, 40-minute lecture, simulation, and 10-days of observations.

Frye and Rushanan (2023) examined the impact of a QI project designed to promote medication management competence based on the knowledge to action framework in a large academic home health agency. Education about medication management was delivered with a 1-

hr online module with videos, accompanied by a pre and post-test. In relation, Ganaden and Mitchell (2018) examined if a QI project involving a comprehensive unit-based safety program would enhance patient safety and improve medication safety. Staff completed a baseline survey of the culture of patient safety, received a 40-minute lecture about safety science, and identified safety concerns. Members of the leadership team attended meetings to determine which interventions could be implemented to improve patient safety (i.e, job shadowing). Staff also completed a post survey about the patient safety culture. Sim et al. (2022) examined the impact of a three-phase patient safety strategy quality improvement project from 2012 to 2016 to reduce the incidence, prevalence, and severity of ADEs, and improve patient safety. Phase one involved identifying common areas of harm such as medication administration and incorrect patient identification. In phase two, a strength, weaknesses, opportunities, and threats (SWOT) analysis was completed to determine root causes, and in phase three simulation training was provided. Chart reviews were conducted from 430,860 admissions from 2012 to 2018.

Two studies reported statistically significant results associated with medication QI projects (Frye and Rushanan, 2023; Sim et al., 2022). In Frye and Rushanan (2023) there was a statistically significant increase in mean medication management competency from 99.68 pre intervention to 124.24 post intervention ($p = .006$). The two areas with the largest mean increases were finding information about medications via agency resources (pre-test= 4.97) (post-test = 7.06) ($p = .004$), and documentation (pre-test = 5.57) (post-test = 7.71) ($p = .006$), which were all statistically significant. In relation, Sim et al. (2022) found a statistically significant decrease in ADEs (11.6% to 5.4 %) ($p = 0.017$), and preventable ADEs (5.7% to 2.0%) ($p = 0.006$). Moreover, the percentage of ADEs causing permanent harm, death, or needing intervention to sustain life decreased from 8.4% to 2.6%. The hospital-wide patient safety grade also increased from 46.5%

to 58.3%, and there was an 82% increase in voluntary reporting. Meanwhile, Ganaden and Mitchell (2018) reported that patient safety culture score increased from 70% to 76.8%. In relation, there was an increase in the number of incident reports received over the duration of a year (2 vs 18, respectively), with a name identified on 54% of these reports. Furthermore, 84% of staff indicated that this QI project was a good or excellent experience.

In contrast, Wagner (2022) used two cohorts of nursing students (n=15) who completed 10 days of problem-based observations which involved monitoring RN-mentored medication administration to determine the impact of a QI project designed to examine nursing management of interruptions during medication administration. Four main themes were identified: “*frequency of interruptions*”, “*prioritization and reasoning*”, “*decision-based learning*”, and “*QI in practice*”. Students identified an increased awareness of the number of interruptions during medication administration and recognized the importance of minimizing these disruptions. In addition, students were able to identify situations that would require a nurse to stop the primary task (medication administration), as well as situations that could wait until the primary task was completed. Moreover, students learned how nurses maintain safety when interrupted such as repeating the rights of medication administration or starting the preparation process over. Students could also understand how this QI was beneficial to practice such as improved attitude toward medication safety, increased awareness of the importance of medication management practices, and learning skills to stay focused.

Frye and Rushanan (2023) and Sim et al. (2022) found statistically significant results related to QI projects and medication management. Although Ganaden and Mitchell (2018) did not report statistically significant results, based on the increases/decreases in mean percentages, the QI project was noted to have a positive impact on medication management skills such as

medication documentation. Furthermore, the common themes identified in Wagner (2022) indicated that this QI project had a positive influence on nursing students. Ganaden and Mitchell (2018) used lecture as an educational strategy in their QI project, while Sim et al. (2022) used simulation, and Wagner (2022) used problem-based learning. As these studies reported either statistically significant results or positive feedback related to the QI project, this indicates that these educational strategies are effective and should be incorporated into the medication management program for DSWs. This relates to Knowles' adult learning principles and Kolb's experiential learning theory, as participants are exposed to a variety of learning techniques, are active participants in the learning process, and can experience hands-on learning and reflection (Knowles, 1978; Kolb, 1984). Based on these findings, QI projects have been proven to be effective to prevent medication errors.

Medication Reconciliation

Medication reconciliation is a process whereby healthcare providers work collaboratively with patients, families, and other care providers to review medication information and ensure accuracy. It is an important component of medication management which allows medication information to be communicated consistently across transitions of care (ISMP, n.d.).

Three medium-quality nurse-led studies (Aiezza et al., 2021; Hron et al., 2015; Young et al., 2015; and one high-quality pharmacy-led study (Stuijt et al., 2021) determined the impact of medication reconciliation on medication management. Aiezza et al. (2021) used a NRCT, while Hron et al. (2015) and Young et al. (2015) used a UCBA design, and Stuijt et al. (2021) conducted a RCT. Aiezza et al. (2021) evaluated the prevalence and nature of potentially inappropriate medications in a group of hospitalized patients. One group (n=100) received medication reconciliation by a nurse, while the other group (n=100) received usual care. Hron et

al. (2015) measured the impact of electronic medication reconciliation on medication errors. An electronic medication reconciliation tool was implemented, and nurses were trained to use it. This allowed nurses to complete a second medication reconciliation and identify any medication reconciliation errors that may have been made upon admission (using the paper chart). Furthermore, Young et al. (2015) examined the effect of using an advanced practice nurse (APN) for medication reconciliation to identify medication discrepancies in elderly cardiac patients. This intervention involved two phases where 200 medication records were reviewed. Phase one involved the usual medication reconciliation process implemented by the hospital/agency, whereas phase two involved the APN reviewing the medication list, documenting client history, updating medication lists, and preparing discharge medication lists. In comparison, Stuijt et al. (2021) assessed the effect of medication reconciliation by pharmacy on patient reported, potential ADEs post discharge. One group (n=138) received usual care, while the other group (n=83) received medication reconciliation performed by pharmacy.

Aiezza et al. (2021) noted that the group who received medication reconciliation was prescribed 7.5 ± 2.8 medications upon admission, versus 8.0 ± 2.4 in the group who did not receive medication reconciliation. After the intervention, there was a statistically significant difference between the mean drugs prescribed post-intervention among those who received medication reconciliation (6.1 ± 3.1) ($p=0.002$). Medication reconciliation found potential errors such as polypharmacy and continued use of drugs that were supposed to be discontinued which accounted for the change in mean number of prescriptions prescribed. In addition, there was also a statistically significant difference found at discharge as the group who received the intervention was found to take two units of medicine less than the group who did not receive the intervention ($p<0.001$). Additionally, the intervention was noted to decrease interactions between drugs by

46% (107 to 38) and decrease potentially inappropriate drugs by 38% (50 to 31) from pre-intervention to post-intervention. In comparison, Hron et al. (2015) found 1816 medication safety errors, of which 153 were related to medication reconciliation. There was a statistically significant difference noted for non-intercepted medication reconciliation errors pre intervention (59) (4.1 per 1000 admissions) and post intervention (36) (2.0 per 1000 admissions) ($p=0.02$). Additionally, the risk of an ADE related to admission medication reconciliation post-intervention was statistically significant, as it was lower than pre-intervention ($RR=0.024$; $p<0.001$). In Young et al. (2015) statistically significant differences were found between the proportions of patients with at least one medication discrepancy pre-intervention (94%) to post-intervention (81%) ($p=0.005$). Furthermore, the mean number of medication discrepancies per patient decreased from pre-intervention (8.09 ± 6.75) to post-intervention (4.32 ± 5.66) ($p=0.005$) due to implementation of an APN for medication reconciliation. This was also considered statistically significant. Based on statistically significant results, the intervention was noted to be most effective at reducing discrepancies related to the following classes of drugs: bowel ($p=.001$), neurologic ($p=.002$), anti-anginal ($p=0.024$). Moreover, Stuijt et al. (2021) noted statistically significant results were reported as the medication reconciliation group reported a lower median number of potential ADEs compared to the group who did not receive medication reconciliation (1.1 vs 2.1) ($p<0.0001$). Receiving the medication reconciliation intervention was also associated with less potential ADEs ($RR=0.5$). Meanwhile, previous admission was associated with a higher number of potential ADEs ($RR=1.3$).

All studies noted statistically significant results related to medication reconciliation and medication management. While Stuijt et al. (2021) was pharmacy-led, the results of this study were still significant and related to the nurse-led studies. Therefore, these findings can be

extrapolated to provide evidence that medication reconciliation is an effective way to improve medication management. The process of medication reconciliation in these studies is related to the experiential learning theory, as nurses get the opportunity to practice completing the medication reconciliation, instead of relying on the pharmacy team (Kolb, 1984). Furthermore, Knowles' adult learning principles are evident in these interventions as learning to complete medication reconciliation is relevancy oriented and practical, as well as provides autonomy and self-direction (Knowles, 1978).

Summary of Interventions and Gaps in the Literature

While many of the interventions identified in the literature have a positive impact on medication management, the most statistically significant effects were noted among studies that involved education and training. Moreover, the literature identifies education and training as the basis of medication management as it increases the understanding of the medication process and improves confidence in medication administration; therefore, contributing to an increased quality of life for patients (Bologan, 2021). According to Sun et al. (2021) educational training addresses the learning needs of caregivers, consequently, improving competence and decreasing harmful effects to patients. Despite the numerous studies that noted the significant impact of education and training on medication management practices, there is a gap in the literature indicating the best mode of delivery for medication management education and training. Furthermore, many of the education and training interventions found in the literature were based on generalized medication errors, instead of the three most common errors: wrong dose, wrong time, and wrong patient. In addition, only one of these interventions (Mariani et al., 2017) was based on a theoretical framework.

Based on the results of the studies discussed, my proposed best practice for addressing medication management is the development of a medication management program that involves several different educational strategies in a classroom setting (i.e., simulation, lecture, problem-based learning), is based on theoretical frameworks and addresses the three most common types of medication errors identified in the literature. Simulation was used for education and training interventions in Dubovi et al. (2017), Mariani et al. (2017), Vital and Nathanson (2023) as well as a QI project in Sim et al. (2022), and all noted statistically significant effects. Additionally, problem-based learning was used in four education and training interventions (Dubovi et al., 2017; Goodwin et al., 2022; Mariani et al., 2017, Vital and Nathanson, 2023). While statistically significant effects were only noted in three of these studies (Dubovi et al., 2017; Mariani et al., 2017, Vital & Nathanson, 2023), the findings from the qualitative data in Goodwin et al. (2022) indicate that the problem-based learning was an effective strategy to use for these interventions. Meanwhile, lecture was used in three education/training interventions (Goodwin et al., 2022; Holland et al., 2013; Vital & Nathanson, 2023), and one QI intervention (Ganaden and Mitchell, 2018). While statistically significant effects were only noted in two studies (Holland et al., 2013; Vital and Nathanson, 2023), the increase and decrease in proportions in Ganaden and Mitchell (2018) indicates that lecture was an effective strategy to use for this intervention. In addition, the constructive results found among the qualitative data in Goodwin et al. (2022) also indicates that lecture was an effective strategy. As lecture, simulation, and problem-based learning were common strategies used in the literature that generated statistically significant or positive results, these strategies were also chosen for the development of my resource. In the following section, I discussed my theoretical frameworks for my proposed resource, as well as linked my theoretical frameworks to my chosen educational strategies.

Medication Management Program for Developmental Support Workers

Education and training are crucial for anyone working in healthcare. To provide medication management education and training to DSWs, the medication management program will be delivered via a half-day workshop. Three studies promote the use of a one-day medication management workshop for front-line employees. (Dyer & Holmes, 2013; Siva, 2014; Thomas et al., 2021). According to Dyer and Holmes (2013), a half-day workshop has many benefits such as increased medication management knowledge and skills, improved quality of care, patient safety, and consistent care. In addition, a half-day workshop is typically developed for front-line employees. Furthermore, Siva (2014) noted that many direct support service core trainings (i.e., medication management) were completed in a half-day training session. Due to the busy schedule of health care workers, Thomas et al. (2021) noted that a half-day workshop is an effective way to provide education and training.

This medication management program will be informed by the results of the consultation plan, environmental scan, as well as the literature. Knowles' adult learning theory and Kolb's experiential learning theory will be used to guide the development of this program. Knowles' adult learning theory will be used to guide the educational strategies for the delivery of the content, while Kolb's experiential theory will be used to guide the development of the workshop and content. In the following section, I will describe my theoretical frameworks and the medication management program.

Theoretical Frameworks

Two theoretical frameworks (The Knowles' adult learning theory and the Kolb's experiential learning theory) will be used to guide the development of the medication management program.

Knowles' Adult Learning Theory

The Knowles' adult learning theory contains a set of principles that are applicable to adult learners (Collins, 2004). This theory indicates that adult learners connect life experience and knowledge to learning, are relevancy-oriented and practical, learn best when they are active participants in learning, and not every adult learns the same way (Knowles, 1978). In relation, adults are autonomous and self-directed learners (Knowles, 1978). The Knowles' adult learning theory will be used to guide the content for the workshop. For instance, I will incorporate content where students must engage in discussion and share experiences such as reading a scenario and asking the group how they would solve the problem or how they have solved the problem in real clinical situations. This will provide learners with relevant learning material that can be applied to practice in connection with any previous knowledge and experience that participants may or may not have which is associated with Knowles' adult learning theory. Additionally, I will include content that requires participants to practice hands-on skills such as reading a medication record, preparing, administering, and documenting the medication. This will ensure learners are actively engaged in the learning process as per Knowles' adult learning theory. Mitchell and Courtney (2008) noted that reading materials for adults based on Knowles' adult learning theory should be prepared at an 8th grade reading level, be visually appealing, and have a suitable size font. Preparing the content based on the Knowles' adult learning theory will ensure the different needs of adult learners are taken into consideration so everyone has a positive learning experience.

The Kolb's Experiential Learning Theory

The Kolb's (1984) experiential learning theory was also used to guide the development of the training program. Kolb (1984) indicated that this theory involves four domains including

experience, perception, cognition, and behavior. While this is similar to the constructivist theory, the experiential learning theory involves the affective domain (i.e., emotions); therefore, learning is viewed as a holistic approach, as opposed to an intellectual or physical approach (Kolb, 1984). According to Sharlanova (2004), this theory involves active learning, with an emphasis on learning by reflection on experience. This is a cyclical process which involves doing, observing, thinking, and planning. The doing phase involves actively completing a task either individually or as a group. The observing phase involves reflecting on the task that was completed to determine feelings about the task and what could be done differently. The thinking phase is when the learner tries to make sense of the task that was completed, while the planning phase involves planning to test a theory differently for future. This theory will be used to inform the different modes of delivery for the medication management workshop. In the doing phase, participants will engage in a simulation and problem-based exercise as a group. In the observing phase, participants will have time to critically reflect and write about their simulation experience. During the thinking phase, participants will engage in group discussion about the simulation and how they can relate this to real clinical situations. The focus in this phase will be learning from each other. Finally, in the planning phase, participants will receive important tips and information about medication management via lecture. Participants can use this information to determine how they can plan to improve in the future. The goal is to have students engaged in active learning through activities such as simulation; however, this program will also allow for students to reflect on activities to determine what they learned, what could be improved, and a plan to improve for real-life clinical situations. When planning the content of this workshop, I need to ensure I incorporate realistic scenarios for the simulations and problem-based learning, as this was a need identified during the consultations with DSWs and managers at Momentum.

The experiential learning theory will guide participants in practicing hands-on skills, but also in the development of learning through reflection and critical thinking. Reflecting on learning through hands-on practice will allow participants to understand their strengths and opportunities regarding medication management. Consequently, medication management practices will improve, and quality care will be provided to patients.

Overview of the Medication Management Program

The medication management program for DSWs will be delivered via a half-day workshop. During consultations with DSWs and managers at Momentum, the majority preferred classroom-based learning with a variety of educational strategies. The goal is to improve medication management knowledge and practices among DSWs; therefore, leading to less medication errors, and improved quality of care for clients. The content of this workshop will focus on the three most common medications errors identified in the literature: wrong dose, wrong time, and wrong medication. In relation, there will also be information about medication preparation (i.e., 8 rights of medication administration, commonly confused medications), administration (i.e., patient identification), documentation (i.e., do not use abbreviations, medication administration record). A lecture, simulation, and problem-based learning will be the educational strategies used to deliver the content of this program.

The lecture will include brief content that is necessary for DSWs to know (i.e., rights of medication administration, storage of medications, disposal guidelines). DSWs will be given a copy of the PowerPoint lecture so they can add additional notes if needed. Questions will be also asked throughout the lecture to simulate group discussion. As per Knowles' adult learning theory, incorporating a lecture will help accommodate the needs of all adult learners, and it will give students an opportunity to plan for future improvements using information learned in the

lecture, as per Kolb's experiential learning theory. After participants learn the basic elements of medication management via lecture, they will engage in simulation-based training. This will allow participants to demonstrate practical skills (i.e., preparing and administering medications), as well as apply critical thinking skills when faced with a scenario (i.e., patient refuses medication or asks questions about prescribed medication). In addition, this will pose an opportunity for participants to reflect on their skills and how they would do things differently when faced with a similar scenario again. For problem-based learning, participants will have the opportunity to engage in several learning activities (i.e., case scenarios) that will be facilitated by the training manager. This will encourage learners to brainstorm ideas together and identify the best possible solution to medication management scenarios that may appear in real clinical situations. This will ensure a variety of learning needs are accommodated as per Knowles' adult learning theory, and ensure participants have the opportunity to practice and reflect on knowledge as per Kolb's experiential learning theory.

Conclusion

The management of medications is an important part of healthcare that requires attention. Although licensed and unlicensed caregivers can manage medications, unlicensed caregivers do not receive the same training and education as licensed caregivers. While the prevalence of medication errors and ADEs are alarming worldwide, ensuring caregivers (especially unlicensed) have the proper education and training can help prevent these errors. While one of the main concerns regarding poor medication management is patient safety, this issue also affects healthcare organizations and caregivers.

To reduce the impact of poor medication management and lower the rate of medication errors, it is essential to have an education and training program available to unlicensed

caregivers. This program will provide support staff with the training they need to become competent in medication management procedures. To address diverse learning needs and promote inclusivity, it is crucial to design a program that incorporates various learning strategies, including lectures, simulations, and problem-based learning. This will ensure participants are motivated to learn; therefore, retaining as much information as possible. As a result, support staff will feel adequately training in medication management; therefore, increasing the quality of care.

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Appendix B: Literature Summary Tables

| Author | Participants/Methods | Results | Comments |
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| <p>Authors: Burgdorf et al. (2022)</p> <p>Design: Cross-sectional</p> <p>Purpose: To describe the prevalence and underlying cause of unmet caregiving needs for sepsis survivors</p> | <p>N: 85, 851 older sepsis survivors receiving home health care (2013-2016)</p> <p>Country/Setting: United States/Home Health Care</p> <p>Data Collection:</p> <ul style="list-style-type: none"> • Medicare Claims • Home Health Care Claims • Outcomes and Assessment Information Set <p>Outcomes:</p> <ul style="list-style-type: none"> • ADE Consequences <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive statistics • Chi-Square | <p>ADE Consequences: (Survivors who experienced an ADE versus survivors who did not)</p> <ul style="list-style-type: none"> • Increased impaired cognitive function (86% vs 79%, p<0.001) • Increased need for medical procedures/treatment (79% vs 75%, p<0.001) • Required additional medical equipment (86% vs 84%, p<0.001) • Increased supervision and monitoring (89% vs 86%, p<0.001) | <p>Strength of Design: Weak</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Tools assumed to be valid and reliable • Lack of information regarding caregiver characteristics • Appropriate statistics used (significant results noted) |

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| <p>Authors: Mayahara et al. (2014)</p> <p>Design: Cross-sectional</p> <p>Purpose: To identify the types of analgesic MEs made by non-professional caregivers and the relationship between type of error and patient pain level</p> | <p>N: 46 patients (prescribed PRN pain medication)</p> <p>Country/Setting: Chicago, United States/ Hospice Programs</p> <p>Data Collection: Chart review by two trained hospice palliative nurses. Two visits to patient home over 3 days</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Caregiver non-adherence to PRN regime • Patient pain related to ADE • Common analgesic errors <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive statistics • t-test • Linear analysis • Multilevel model | <p>Caregiver non-adherence to pain medication</p> <ul style="list-style-type: none"> • 21% <p>Patient pain related to ADE</p> <ul style="list-style-type: none"> • p= 0.046 <p>Common analgesic errors</p> <ul style="list-style-type: none"> • Administrating a sedative instead of an analgesic • p= 0.024 | <p>Strength of Design: Weak</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Possible selection bias (nurse case managers picked subjects) • Small sample size • Appropriate statistics used (significant results noted) |
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Note. ADE: Adverse Drug Effect; BN: Bachelor of Nursing; CT: Control; DC: Discharge; INT: Intervention; MAP: Medication Administration Procedure; ME: Medication Error; MET: Medical Emergency Team; MR; Medication Reconciliation

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| <p>Authors: Shamliyan and Kane (2016)</p> <p>Design: Cross-sectional</p> <p>Purpose: To examine the national estimates of preventable drug related hospitalizations and in hospital ADE</p> | <p>N: 1000 acute care hospitals</p> <p>Country/Setting: United States/ Acute Care Hospitals</p> <p>Data Collection: Medicare beneficiaries from Nationwide Inpatient Sample Healthcare Cost and Utilization</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Cost of hospitalization due to ADEs • Length of stay for inpatient ADE vs outpatient ADE • Common drugs related to ADEs • Treatment costs related to ADEs <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive Statistics • Regression | <p>Costs of Hospitalization due to ADEs</p> <ul style="list-style-type: none"> • 2000: \$9 billion • 2008: \$44 billion <p>Length of stay for inpatient ADE vs outpatient ADE</p> <ul style="list-style-type: none"> • 6.5 days vs 5.6 days • p<.0001 <p>Common Drugs Related to ADEs</p> <ul style="list-style-type: none"> • Anticoagulants • Cardiovascular • Hormones • Analgesics • Systemic Agents <p>Treatment Costs related to ADEs</p> <ul style="list-style-type: none"> • \$1 billion | <p>Strength of Design: Moderate</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Lack of information regarding patient characteristics • Large sample size • Appropriate statistics used |
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| <p>Authors: Sim et al. (2022)</p> <p>Design: Cross-sectional</p> <p>Purpose: To determine if implementation of an effective patient safety strategy improves hospital wide ADE rates, and patient safety culture</p> | <p>N: 430, 860 admissions from 2012-2018</p> <p>Country/Setting: Asia/National University Hospital</p> <p>Data Collection:</p> <ul style="list-style-type: none"> • Chart Review <p>Outcomes:</p> <ul style="list-style-type: none"> • ADE rates • Patient Safety <p>Analysis:</p> <ul style="list-style-type: none"> • Fisher Exact Test • Unpaired Students t test • Simple Linear Regression | <p>ADE Rates- %, p value</p> <ul style="list-style-type: none"> • 2012: 11.6% • 2018: 5.4% • p =0.017 <p>Preventable ADE Rates- %, p value</p> <ul style="list-style-type: none"> • 2012: 5.7% • 2018: 2.0% • p= 0.006 <p>Category G (permanent harm), H (life-sustaining intervention), I (death) ADE rates- %</p> <ul style="list-style-type: none"> • 2012: 8.4% • 2018: 5.6% <p>Hospital Wide Patient Safety Grade-%</p> <ul style="list-style-type: none"> • 2012: 46.5% • 2018: 58.3% | <p>Strength of Design: Weak</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Single source recruitment • Tools assumed to be valid and reliable • Random process used for chart review (minimize risk of bias) • Statistics appropriate for level of data (significant results noted) |
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| <p>Authors: Slight et al. (2018)</p> <p>Design: Cross-sectional</p> <p>Purpose: To estimate the national cost of ADEs resulting from inappropriate medication alert overrides</p> | <p>N: 40, 990 adult inpatients</p> <p>Country/Setting: US/ Brigham and Women’s Hospital</p> <p>Data Collection: 2014 National Inpatient Sample Data</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Common medication alerts • ADEs resulting from alert overrides • Treatment costs related to ADEs <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive statistics • Regression model | <p>Common Medication Alerts</p> <ul style="list-style-type: none"> • Drug-allergy • Drug-drug interaction • Duplicate drug • Drug dosing <p>ADEs resulting from alert overrides</p> <ul style="list-style-type: none"> • 196,600 ADEs from 78.8 million overrides <p>Treatment costs related to ADEs</p> <ul style="list-style-type: none"> • \$871 million to 1.8 billion | <p>Strength of Design: Weak</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Tools assumed to be valid and reliable • Similar baseline characteristics • Appropriate statistics used |
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| <p>Authors: Trieber and Jones (2018)</p> <p>Design: Cross-sectional</p> <p>Purpose: To examine second victim syndrome and the impact on nurses</p> | <p>N: 168 nurses (new graduates)</p> <p>Country/Setting: US/Hospital</p> <p>Data Collection: Online survey (Feelings about making a medication error)</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Rate of MES by nurses • Most common MES • Emotional impact <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive statistics • Content analysis | <p>Rate of MEs by Nurses</p> <ul style="list-style-type: none"> • 56% made at least one error <p>Most Common MES</p> <ul style="list-style-type: none"> • Incorrect dose • Incorrect route • Incorrect day <p>Emotional Impact</p> <ul style="list-style-type: none"> • Fear • Anger • Frustration • Disappointment • Visceral symptoms (vomiting) | <p>Strength of Design: Weak</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Small sample size (low response rate) • Tools assumed to be valid and reliable (based on questions asked) • Possible misclassification bias related to online survey |
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| <p>Authors: Melnyk et al. (2018)</p> <p>Design: Cross-sectional</p> <p>Purpose: To determine the relationship between nurses' health and MEs</p> | <p>N: 1790 nurses in clinical practice</p> <p>Country/Setting: United States/ 10 professional nursing organizations</p> <p>Data Collection: 53-item survey including the professional quality of life scale</p> <p>Outcomes:</p> <ul style="list-style-type: none"> Professional Quality of Life (Self- Confidence) <p>Analysis:</p> <ul style="list-style-type: none"> Descriptive statistics Chi-square Multiple logistic regression | <p>Professional Quality of Life Scale (Self- Confidence)</p> <ul style="list-style-type: none"> 56.04% scored 0-11 indicating low professional quality of life and decreased self-confidence | <p>Strength of Design: Weak</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> Large sample size Possible information bias related to self-reporting Appropriate use of statistics |
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| <p>Authors: Quillivan et al. (2016)</p> <p>Design: Cross-sectional</p> <p>Purpose: To assess the influence of patient safety on second victim related distress</p> | <p>N: 170 nurses involved in direct patient care</p> <p>Country/Setting: US/pediatric hospital</p> <p>Data Collection:</p> <ul style="list-style-type: none"> • The Agency for Healthcare Research and Quality Hospital Survey on Patient Culture • Second Victim Experience Support Tool <p>Outcomes:</p> <ul style="list-style-type: none"> • Self-Confidence <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive statistics • Multiple Regression | <p>Self- Confidence</p> <ul style="list-style-type: none"> • Association between decreased self-confidence and ME • Poor patient safety culture= decreased self-confidence • Non punitive responses associated with increased self-confidence (p=0.001) • Organizational support associated with increased self-confidence (p<0.01) | <p>Strength of Design: Weak</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Tools known to be valid and reliable • Small sample size • Appropriate statistics used (significant results noted) • Possible information bias due to self-reporting |
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| <p>Authors: Dubovi et al. (2017)</p> <p>Design: Non-Randomized Controlled Trial</p> <p>Purpose: To evaluate the effectiveness of Pharmacology Inter-Leaved Learning Virtual Reality Simulation</p> | <p>N: 129 BN students</p> <p>Country/setting: Haifa, Israel/Hospital</p> <p>INT: 82 BN students (received virtual simulation)</p> <p>CT: 47 BN students (received lectures)</p> <p>Data collection: MAP Questionnaire (Pre and posttest)</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • MAP knowledge (overall) • Medication administration sequence (subscale) • Basic procedural concepts (subscale) <p>Analysis</p> <ul style="list-style-type: none"> • Descriptive statistics- Categorical variables (% , mean, number & SD). Continuous variables (mean, number, %, SD, median) • Mann-Whitney U test & ANOVA | <p>MAP Knowledge (Overall)- mean, SD, p value</p> <p>Pre-test:</p> <ul style="list-style-type: none"> • INT (55 ± 17) • CT (51± 20) <p>Posttest:</p> <ul style="list-style-type: none"> • INT (93 ± 7) • CT (52± 25) • p<0.001 <p>Medication Administration Sequence- mean, SD, p value</p> <p>Pre-test:</p> <ul style="list-style-type: none"> • INT (32 ± 24) • CT (38± 19) <p>Posttest:</p> <ul style="list-style-type: none"> • INT (83 ± 19) • CT (41± 24) • p<0.001 <p>Basic Procedural Concepts- mean, SD, p value</p> <p>Pre-test:</p> <ul style="list-style-type: none"> • INT (67 ± 24) • CT (65 ± 29) <p>Posttest:</p> <ul style="list-style-type: none"> • INT (98± 5) • CT (57± 31) • p<0.001 | <p>Strength of Design: Strong</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Recruitment from a single source • Strong intervention integrity • Tools known to be valid and reliable • High dropout rate (CT group) |
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Note. ADE: Adverse Drug Effect; BN: Bachelor of Nursing; CT: Control; DC: Discharge; INT: Intervention; MAP: Medication Administration Procedure; ME: Medication Error; MET: Medical Emergency Team; MR; Medication Reconciliation 94

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| <p>Authors: Holland et al. (2013)</p> <p>Design: Mixed-methods Non-Randomized Controlled Trial/Phenomenological</p> <p>Purpose: To evaluate the use of a best practice exemplar as an adjunct to clinical skill teaching for medication administration</p> | <p>N: 322 undergraduate nursing students</p> <p>Country/setting: United Kingdom/Britch University</p> <p>INT: 168 first year nursing students (received lectures + online video)</p> <p>CT: 154 first year nursing students (received lectures)</p> <p>Data collection:</p> <ul style="list-style-type: none"> • 8 station objective structured clinical examination • National Student Satisfaction Survey (Likert scale and short-answer questions) <p>Outcomes:</p> <ul style="list-style-type: none"> • Objective Structured Clinical Examination results (pass or fail) • Student Satisfaction <p>Analysis</p> <ul style="list-style-type: none"> • Descriptive statistics- Chi-Square test; Mann-Whitney U-test • Thematic Analysis | <p>Objective Structured Clinical Examination (Pass)- %, p value</p> <ul style="list-style-type: none"> • INT: 79.2% • CT: 65.5% • p= 0.021 <p>Student Satisfaction Scores- % of questions answered as a 5 (highly satisfied) on Likert scale, p value</p> <ul style="list-style-type: none"> • INT: 48% • CT: 0% • p<0.05 <p>Classroom Learning</p> <ul style="list-style-type: none"> • Learning from peers • Using additional resources (video) as a reference point • Well-prepared for clinical practice <p>Transfer to Practice</p> <ul style="list-style-type: none"> • Learning the basics in the classroom • Further development of classroom learning in clinical | <p>Strength of Design: Strong</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Tools known to be valid and reliable • Control for major confounders • Risk of misclassification bias (intervention integrity) <p>Trustworthiness: Moderate</p> <p>Strengths:</p> <ul style="list-style-type: none"> • Member checking • Recording and verbatim • Triangulation <p>Limitations:</p> <ul style="list-style-type: none"> • Data saturation • No audit trail |
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| <p>Authors: Aiezza et al. (2021)</p> <p>Design: Non-Randomized Controlled Trial</p> <p>Purpose: Evaluate the prevalence and nature of potentially inappropriate medications in a group of hospitalized older patients</p> | <p>N: 200 patients > 65 years</p> <p>Country/setting: Italy/Antonio Cardarelli Hospital</p> <p>INT: 100 Patients (received MR) CT: 100 Patients (received usual care)</p> <p>Data collection: Interviews and Chart Review</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Number of medications prescribed upon admission • Number of medications after MR • Potentially inappropriate drugs (before and after MR) • Drug to drug interactions (before and after MR) <p>Analysis</p> <ul style="list-style-type: none"> • Chi-Square | <p>Number of medications upon Admission – (Mean)</p> <ul style="list-style-type: none"> • Int: 7.5 ± 2.8 • CT: 8.0 ± 2.4 <p>Number of medications after MR- (Mean and p value)</p> <ul style="list-style-type: none"> • INT: 6.1 ± 3.1 • $p= 0.002$ • INT found to take 2 units less medication at DC versus CT group ($p<0.001$) <p>Potentially inappropriate Drugs (%)</p> <ul style="list-style-type: none"> • Before MR: 50 • After MR: 31 • Decreased 38% <p>Drug to drug interactions</p> <ul style="list-style-type: none"> • Before MR: 107 • After MR: 38 • Decreased 46% | <p>Strength of Design: Strong</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Similar baseline characteristics • Strong intervention integrity • No randomization or control for major confounders |
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| <p>Authors: Assiri et al. (2018)</p> <p>Design: Systematic Review</p> <p>Purpose: To investigate the prevalence of MEs and ADEs among adults in various healthcare settings</p> | <p>N: 60 studies (adults > 18 years old)</p> <p>Country/setting: Asia/Australia, Europe, South America, North America/ various healthcare settings</p> <p>Data collection: Self reports, lab testing, chart review</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Consequences of ADEs • Risk of ADEs <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive Statistics | <p>Consequences of ADEs:</p> <ul style="list-style-type: none"> • Emergency Room Visits • Hospitalization • Increased outpatient visits <p>Risk of ADEs</p> <ul style="list-style-type: none"> • Taking >7 medications (OR= 3.3) • > 80 years old (OR=4.4) | <p>Strength of Design: Strong</p> <p>Quality: High</p> <p>Comments:</p> <ul style="list-style-type: none"> • Comprehensive search for literature • Rigorous review process • Similar results interpreted in a meaningful way |
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| <p>Authors: Seys et al. (2013)</p> <p>Design: Systematic Review</p> <p>Purpose: To determine the prevalence and impact of ADEs on second victims</p> | <p>N: 65 studies involving nurses who made a ME</p> <p>Country/Setting: Australia, Germany, England, Scotland, US/Hospital</p> <p>Data Collection:</p> <ul style="list-style-type: none"> • Questionnaires • Interviews • Focus Groups <p>Outcomes:</p> <ul style="list-style-type: none"> • Self-Confidence <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive statistics • Content analysis | <p>Self-Confidence</p> <ul style="list-style-type: none"> • Feeling personally responsible • Fear of reputation • Losing self confidence | <p>Strength of Design: Strong</p> <p>Quality: High</p> <p>Comments:</p> <ul style="list-style-type: none"> • Rigorous selection process • Similar results interpreted in a meaningful way • Comprehensive search for literature |
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| <p>Authors: Frye and Rushanan (2023)</p> <p>Design: Uncontrolled Before-After</p> <p>Purpose: To evaluate the impact of a medication management education quality improvement project</p> | <p>N: 47 nurses</p> <p>Country/setting: United States/ home health organization</p> <p>Data collection: Survey (10-point Likert scale), 16 questions</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Overall medication management competence • Subscales with largest increases <ol style="list-style-type: none"> 1. Finding information about medications via agency resources 2. Documentation <p>Analysis</p> <ul style="list-style-type: none"> • Descriptive statistics • One-way ANOVA | <p>Overall Competence- mean, p value</p> <ul style="list-style-type: none"> • Pre: 99.68 • Post: 124.24 • p= 0.006 <p>Finding information about medications via agency resources- mean, p value</p> <ul style="list-style-type: none"> • Pre: 4.97 • Post:7.06 • p= 0.004 <p>Documentation- mean, p value</p> <ul style="list-style-type: none"> • Pre: 5.57 • Post: 7.71 • p= 0.006 | <p>Strength of Design: Weak</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Strong intervention integrity • Risk of information bias (survey mailed) • Tools assumed to be valid and reliable based on nature of questions asked • Regression used to account for major confounders |
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| <p>Authors: Ganaden and Mitchell (2018)</p> <p>Design: Uncontrolled Before-After</p> <p>Purpose: To determine if a Comprehensive Unit-Based Program could enhance patient and medication safety</p> | <p>N: 16 staff working at an assisted living residence (received medication safety quality improvement intervention)</p> <p>Country/Setting: Canada/ Assisted Living Residence</p> <p>Data Collection: Canadian Patient Safety Culture Survey Tool (Pre and posttest)</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Culture Patient Safety Score • Confidence • Project Evaluation <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive statistics | <p>Canadian Patient Safety Score-%</p> <ul style="list-style-type: none"> • Pre: 70% • Post: 76.8% <p>Confidence (“Others make you feel like a bit of a failure when you make an error”)-%</p> <ul style="list-style-type: none"> • Pre: 33.4% agreed • Post:8.3% agreed <p>Incident Reporting- number</p> <ul style="list-style-type: none"> • Pre: 2 • Post: 18 • 54% (name identified) <p>Project Evaluation-%</p> <ul style="list-style-type: none"> • 84% (Good to Excellent) • 46% (Very Good) | <p>Strength of Design: Weak</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Recruited from a single source; small sample • Strong intervention integrity • Tools known to be valid and reliable • Control of major confounders not assessed |
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Note. ADE: Adverse Drug Effect; BN: Bachelor of Nursing; CT: Control; DC: Discharge; INT: Intervention; MAP: Medication Administration Procedure; ME: Medication Error; MET: Medical Emergency Team; MR; Medication Reconciliation

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| <p>Authors: Hron et al. (2015)</p> <p>Design: Uncontrolled Before-After</p> <p>Purpose: To measure the impact of electronic MR implementation on reports of MR errors</p> | <p>N: 146 admissions (received MR)</p> <p>Country/Setting: United States/ Boston Hospital</p> <p>Data Collection: Safety Event Event Reporting System</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Non-intercepted MR errors • ADE related to admission MR <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive statistics • Poisson Regression | <p>Non-intercepted MR errors</p> <ul style="list-style-type: none"> • Pre: 59 • Post: 36 • $p=0.02$ <p>ADE related to admission MR- (relative risk pre vs post intervention)</p> <ul style="list-style-type: none"> • $RR=0.024$ • $p<0.001$ | <p>Strength of Design: Weak</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Small sample size • Tools assumed to be valid and reliable • Voluntary reporting may lead to information bias • Control for major confounders via regression |
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| <p>Authors: Young et al. (2015)</p> <p>Design: Uncontrolled Before-After</p> <p>Purpose: To examine the effect of advanced practice nurse managed MR on occurrence of medication discrepancies in elderly cardiac patients</p> | <p>N: 200 patients (received MR)</p> <p>Country/Setting: US/rural hospital</p> <p>Data Collection: Medical records</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Medication Discrepancies (at least one) • Mean Medication Discrepancies per Patient • Drug Classes Affected by Intervention <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive statistic • Chi-Square | <p>Medication Discrepancies (at least one)</p> <ul style="list-style-type: none"> • Pre: 94% • Post: 81% • p= 0.005 <p>Mean Medication Discrepancies per patient</p> <ul style="list-style-type: none"> • Pre: 8.09 ± 6.75 • Post: 4.32 ± 5.66 • p= 0.005 <p>Drug Classes Most Affected by Intervention</p> <ul style="list-style-type: none"> • Bowel (p=0.001) • Neurologic (p= 0.002) • Antianginal (p= 0.024) | <p>Strength of Design: Weak</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Strong intervention integrity (blinding) • Tools assumed to be valid and reliable • Appropriate statistics used (significant results noted) <p>Similar baseline characteristics</p> |
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Note. ADE: Adverse Drug Effect; BN: Bachelor of Nursing; CT: Control; DC: Discharge; INT: Intervention; MAP: Medication Administration Procedure; ME: Medication Error; MET: Medical Emergency Team; MR; Medication Reconciliation 102

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| <p>Authors: Mariani et al. (2017)</p> <p>Design: Randomized Controlled Trial</p> <p>Purpose: To determine the impact of a medication safety simulation on student knowledge and competence</p> | <p>N: 86 BN students</p> <p>Country/setting: US/private university</p> <p>INT: 43 students (received two simulations)</p> <p>CT: 43 students (received one simulation)</p> <p>Data collection:</p> <ul style="list-style-type: none"> • Medication Safety Knowledge Assessment (25 multiple choice) • Medication Safety Competence Element Checklist (11-items to measure skills and competence) <p>Outcomes:</p> <ul style="list-style-type: none"> • Medication Knowledge • Medication Safety <p>Analysis</p> <ul style="list-style-type: none"> • Chi-Square test • Independent t test | <p>Medication Knowledge- % passed (≥ 21 questions), p value</p> <p>Pre-test</p> <ul style="list-style-type: none"> • INT: 5% • CT: 7% <p>Post-test</p> <ul style="list-style-type: none"> • INT: 57% • CT: 28% • p=0.02 <p>Medication Safety-mean (%), p value</p> <ul style="list-style-type: none"> • INT: 70.4% • CT: 56.1% • p=0.028 | <p>Strength of Design: Strong</p> <p>Quality: High</p> <p>Comments:</p> <ul style="list-style-type: none"> • Strong intervention integrity • Tools known to be valid and reliable • Significant results found • Randomization (control for major confounders) |
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| <p>Authors: Vital and Nathanson (2023)</p> <p>Design: Randomized Controlled Trial</p> <p>Purpose: to measure the impact of the stay S.A.F.E intervention on nursing students management of interruptions during medication administration</p> | <p>N: 39 nursing students Country/Setting: United States/Simulation Lab INT: 20 nursing students (received two educational lectures) CT: 19 nursing students (received one educational lecture) Data Collection:</p> <ul style="list-style-type: none"> • Eye Tracker • NASA Task-Load Index • Facilitator (Observed for clinical errors and procedural errors) <p>Outcomes:</p> <ul style="list-style-type: none"> • Return time to primary task • Appropriate Interruption Response <p>Analysis:</p> <ul style="list-style-type: none"> • Student's t test • Mann-Whitney U test • Chi-square test • Fisher exact test • McNemar test • Wilcoxon matched-pairs signed ranks test • ANOVA | <p>Time (secs) to Return to Primary Task: Simulation 2</p> <ul style="list-style-type: none"> • INT: 11.9 • CT: 18.9 • p= .007 <p>Time (secs) to Return to Primary Task (simulation 1, 2, 3)- mean, p value</p> <ul style="list-style-type: none"> • INT: 30.1 vs 12.0 vs 13.0 • p= <0.001 <p>Inappropriate response (taking report)(simulation 1, 2, & 3) - % of students, p value</p> <p>INT</p> <ul style="list-style-type: none"> • 64.7% vs 5.0% vs 5.6% • p= 0.002 <p>CT</p> <ul style="list-style-type: none"> • 43.8% vs 36.8% vs 26.3% • p= 0.008 <p>Mean Frustration Scores (simulation 1, 2, 3)- mean ,p value</p> <p>INT:</p> <ul style="list-style-type: none"> • 23.4 vs 19.3 vs 12.4 • p=0.034 <p>CT:</p> <ul style="list-style-type: none"> • 14.5 vs 24.5 vs 14.7 | <p>Strength of Design: Strong</p> <p>Quality: High</p> <p>Comments:</p> <ul style="list-style-type: none"> • Recruitment from a single source; baseline characteristics similar • Objective measures used; strong intervention integrity • Control for major confounders • Tools shown to be valid and reliable |
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Note. ADE: Adverse Drug Effect; BN: Bachelor of Nursing; CT: Control; DC: Discharge; INT: Intervention; MAP: Medication Administration Procedure; 104
ME: Medication Error; MET: Medical Emergency Team; MR; Medication Reconciliation

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| <p>Authors: Stuijt et al. (2021)</p> <p>Design: Randomized Controlled Trial</p> <p>Purpose: To assess the effect of a MR on potential AEs post discharge</p> | <p>N: 221 patients</p> <p>Country/setting: Europe/Hospital in the Netherlands</p> <p>INT: 83 patients (received MR)</p> <p>CT: 138 patients (did not receive MR)</p> <p>Data collection:</p> <ul style="list-style-type: none"> • Interviews • Questionnaire • Chart Review <p>Outcomes:</p> <ul style="list-style-type: none"> • AEs post discharge • Potential AEs <p>Analysis</p> <ul style="list-style-type: none"> • Descriptive statistics- Independent t test, Mann-Whitney U-test • Univariate regression analysis, ANOVA | <p>ADEs Post Discharge- median, p value</p> <ul style="list-style-type: none"> • INT: 1.1 • CT: 2.1 • $p < 0.0001$ <p>Potential for ADEs (INT group)- RR value</p> <ul style="list-style-type: none"> • RR=0.5 <p>Potential for ADEs (previous admission)- RR value</p> <ul style="list-style-type: none"> • RR=1.3 | <p>Strength of Design: Strong</p> <p>Quality: High</p> <p>Comments:</p> <ul style="list-style-type: none"> • Strong intervention integrity • Tools assumed to be valid and reliable • Control for major confounders • Data collectors trained |
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Note. ADE: Adverse Drug Effect; BN: Bachelor of Nursing; CT: Control; DC: Discharge; INT: Intervention; MAP: Medication Administration Procedure; 105
ME: Medication Error; MET: Medical Emergency Team; MR; Medication Reconciliation

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| <p>Authors: Zheng et al. (2022)</p> <p>Design: Randomized Controlled Trial</p> <p>Purpose: To investigate the impact of MR, through avoidance of medication discrepancies, on enhanced recovery after surgery</p> | <p>N: 65 patients (orthopedic surgery)</p> <p>INT: 33 (received MR)</p> <p>CT: 32 (did not receive MR)</p> <p>Country/Setting: China/ Large Tertiary Care Hospital</p> <p>Data Collection: Medical Charts</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Length of Stay • Readmission • Time between first admission and new prosthesis <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive statistics • Fisher's Exact Test | <p>Length of Stay</p> <ul style="list-style-type: none"> • INT: 16.3 days • CT: 20.7 days • p= 0.03 <p>Readmission</p> <ul style="list-style-type: none"> • INT: 0 • CT: 3 <p>Time Between First Admission and New Prosthesis</p> <ul style="list-style-type: none"> • INT: 57.3 days • CT: 70.5 days • p= 0.002 | <p>Strength of Design: Strong</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Strong intervention integrity • Tools assumed to be valid and reliable <p>No blinding used which may contribute to information bias</p> |
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| <p>Authors: McCarthy et al. (2017)</p> <p>Design: Case-control</p> <p>Purpose: To determine the economic impact of ADEs resulting in patient harm on hospitalization costs and length of stay</p> | <p>N: 3,521 patients</p> <p>Case: 242 patients experienced ADE</p> <p>Control: 3,279 patients who did not experience an ADE</p> <p>Country/Setting: United States/University of Chicago Medicine</p> <p>Data Collection:</p> <ul style="list-style-type: none"> • Hospital patient database • Hospital accounting database <p>Outcomes:</p> <ul style="list-style-type: none"> • Drug classifications related to medication errors • Length of stay related to drug classifications <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive statistics • Mann-Whitney U Test | <p>Drug classifications related to MEs</p> <ul style="list-style-type: none"> • Chemotherapy (38%) • Corticosteroids (14%) • Opioids (11%) <p>Length of stay (days) related To drug classifications:</p> <p>Chemotherapy</p> <ul style="list-style-type: none"> • Case: 5.0-11 • Control: 4.0-7.0 • p=0.005 <p>Corticosteroids</p> <ul style="list-style-type: none"> • Case: 4.0-7.8 • Control: 3.7-5.3 • p=0.235 <p>Opioids</p> <ul style="list-style-type: none"> • Case: 14.8-16.0 • Control: 4.2-7.2 • p= 0.251 | <p>Strength of Design: Moderate</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Similar baseline characteristics • Some control of major confounders • Appropriate statistics used (significant results noted) |
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Note. ADE: Adverse Drug Effect; BN: Bachelor of Nursing; CT: Control; DC: Discharge; INT: Intervention; MAP: Medication Administration Procedure; 107
ME: Medication Error; MET: Medical Emergency Team; MR; Medication Reconciliation

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| <p>Authors: Choi et al. (2016)</p> <p>Design: Retrospective case control</p> <p>Purpose: To estimate incidence, types, and causes of MR, as well as attributable costs in the hospital setting</p> | <p>N: 57, 554 patients</p> <p>Country/Setting: United States/Two Hospitals in New Jersey</p> <p>Data Collection:</p> <ul style="list-style-type: none"> • Voluntary error reports • Hospital database <p>Outcomes:</p> <ul style="list-style-type: none"> • Treatment costs associated with MEs <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive statistics • Chi-Square test • Generalized linear model | <p>Treatment costs associated with medication errors</p> <ul style="list-style-type: none"> • \$8439- 8898 per two hospitals | <p>Strength of Design: Moderate</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Small Sample size • Possible information bias due to voluntary error reporting • Control for major confounders |
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| <p>Authors: Levkovich et al. (2022)</p> <p>Design: Case Series</p> <p>Purpose: To estimate the incidence and preventability of medication related MET activations and associated ADEs</p> | <p>N: 628 MET activations (adults >18 years old)</p> <p>Country/Setting: Melbourne, Australia/ two academic health services</p> <p>Data Collection: Hospital Database and medical records</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Consequences of MET activations related to ADEs <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive statistics • Mann-Whitney U test | <p>Consequences of MET activations related to ADEs</p> <ul style="list-style-type: none"> • Tachycardia (10.9%) • Hypotension (9.8%) • Inappropriate use of antihypertensives (10.9%) | <p>Strength of Design: Moderate</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Small sample size • Trained research assistants and blinding used • Possible information bias due to use of secondary information |
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| <p>Authors: Schlosser et al. (2020)</p> <p>Design: Retrospective analysis</p> <p>Purpose: To determine length of stay and 30-day readmission rate associated with reduced patient opioid use after hip and knee arthroplasty</p> | <p>N: Review of 51,824 hip and knee arthroplasty</p> <p>Country/Setting: US/ Large HealthCare System</p> <p>Data Collection: Chart Review</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Length of Stay • 30-day readmission rates • Opioid use and ME <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive statistics • Ordinal logistic regression | <p>Length of Stay</p> <ul style="list-style-type: none"> • Low dose morphine associated with decreased length of stay ($p < 0.001$) • Low dose morphine associated with increased chance of discharge 1 dy post-op versus high dose morphine (41.2% vs 19.6%) <p>30- Day Readmission Rate</p> <ul style="list-style-type: none"> • Low dose morphine = 15.3% reduction in readmission <p>Opioid Use and ME</p> <ul style="list-style-type: none"> • Low dose morphine = decreased medication errors ($p < 0.001$) | <p>Strength of Design: Moderate</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Tools assumed to be valid and reliable • Similar baseline characteristics • Control for major confounders • Large sample size |
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| <p>Authors: Moore et al. (2022)</p> <p>Design: Retrospective observational</p> <p>Purpose: To determine the impact of a nurse practitioner for non-medical prescribing for patients admitted with Parkinson's</p> | <p>N: 31 patients (admitted with Parkinson's)</p> <p>Country/Setting: United Kingdom/District Hospital</p> <p>Data Collection: Chart Review</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Average length of stay • Costs per patient per average length of stay • Costs per 30 patients per average length of stay <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive statistics | <p>Average length of stay</p> <ul style="list-style-type: none"> • 2010: 24 days • 2014: 12 days • 2015: 9 days <p>Costs per patient per average length of stay</p> <ul style="list-style-type: none"> • 24 days: \$9190.32 • 12 days: \$4595.16 • 9 days: \$446.37 <p>Costs per 30 patients per average length of stay</p> <ul style="list-style-type: none"> • 24 days: \$275,709.60 • 12 days: \$137,854.80 • 9 days: \$103,391.10 | <p>Strength of Design: Moderate</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Small sample size • Tools assumed to be valid and reliable • Statistics appropriate for level of data |
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| <p>Authors: George et al. (2022)</p> <p>Design: Retrospective Cohort</p> <p>Purpose: To determine the association between ADEs and healthcare costs</p> | <p>N: 15,152 patients diagnosed with cancer</p> <p>Country/Setting: United States/ Buffalo cancer center</p> <p>Data Collection: Medical and Pharmacy claims</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Length of stay related to ADE • Treatment costs of length of stay related to ADE • ADE treatment costs <p>Analysis:</p> <ul style="list-style-type: none"> • Descriptive Statistics • Cox Regression | <p>Length of Stay (ADE)-Hazard Ratio</p> <ul style="list-style-type: none"> • Increased risk of inpatient stay (HR= 2.2) • 80% higher risk of emergency room visit (HR=1.8) <p>Length of Stay Costs- (6-month total costs)</p> <ul style="list-style-type: none"> • ADE: \$99,037 • No ADE: 74,756 • P<0.001 <p>ADE treatment costs</p> <ul style="list-style-type: none"> • \$2359 ± 7496 per patient per month, 89.9% related to inpatient visits | <p>Strength of Design: Moderate</p> <p>Quality: Medium</p> <p>Comments:</p> <ul style="list-style-type: none"> • Large sample size • Possible residual confounders • Tools assumed to be valid and reliable • Similar baseline characteristics |
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Note. ADE: Adverse Drug Effect; BN: Bachelor of Nursing; CT: Control; DC: Discharge; INT: Intervention; MAP: Medication Administration Procedure; ME: Medication Error; MET: Medical Emergency Team; MR; Medication Reconciliation 112

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| <p>Authors: Morrudo Garcia et al. (2020)</p> <p>Design: Descriptive-exploratory</p> <p>Purpose: To identify the consequences of errors in drug therapy from nursing point of view</p> | <p>N: 4 nurses, 3 auxiliaries, 19 nursing technicians</p> <p>Country/Setting: Brazil/Medical/Clinic Unit</p> <p>Data Collection: Semi-structured interviews (Sept-Oct 2016)</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Impact of medication errors (nurses) <p>Analysis:</p> <ul style="list-style-type: none"> • Content Analysis | <p>Impact of MEs on Nurses</p> <ul style="list-style-type: none"> • Administrative proceedings (dismissal, verbal, written) • Withdrawal from work for training • Being exposed to the entire team <p>Emotional Impact</p> <ul style="list-style-type: none"> • Fear • Shame • Uncertainty | <p>Trustworthiness: High</p> <p>Comments:</p> <ul style="list-style-type: none"> • Triangulation • Data saturation • Verbatim transcription • Search for confirming evidence |
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| <p>Authors: Mahat et al. (2022)</p> <p>Design: Qualitative descriptive</p> <p>Purpose: To determine negative emotions expressed by healthcare staff in their reporting of MEs</p> | <p>N: 72, 390 incident reports</p> <p>Country/Setting: England/Hospital</p> <p>Data Collection: Incident reports from the National Reporting and Learning System</p> <p>Outcomes:</p> <ul style="list-style-type: none"> Negative emotions expressed by healthcare staff <p>Analysis:</p> <ul style="list-style-type: none"> Content analysis | <p>Negative Emotions Expressed by Healthcare Staff</p> <ul style="list-style-type: none"> Stress Devastation Questioning competence Decreased self-confidence | <p>Trustworthiness: High</p> <p>Comments:</p> <ul style="list-style-type: none"> Use of a codebook Verbatim transcription Data saturation Search for confirming evidence Triangulation |
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| <p>Authors: Wagner (2022)</p> <p>Design: Qualitative descriptive</p> <p>Purpose: To determine the impact of a quality improvement project examining nurse medication interruptions on nursing student</p> | <p>N: 15 nursing students (two cohorts)</p> <p>Country/setting: 32-bed pulmonary medical-surgical ward</p> <p>Data collection:</p> <ul style="list-style-type: none"> • Focus group (open-ended questions) <p>Outcomes:</p> <ul style="list-style-type: none"> • Frequency of interruptions • Prioritization and reasoning • Decision-making learning • QI in practice <p>Analysis</p> <ul style="list-style-type: none"> • Thematic analysis | <p>Frequency of Interruptions</p> <ul style="list-style-type: none"> • Increased awareness regarding the number of interruptions • Recognized the importance of minimizing these disruptions <p>Prioritization and Reasoning</p> <ul style="list-style-type: none"> • Identify priority situations that require medication administration task to stop • Able to delegate when a task is not essential <p>Decision-Making Learning</p> <ul style="list-style-type: none"> • Able to identify when patient safety may have been compromised • Increased knowledge of medication management tips <p>QI in Practice</p> <ul style="list-style-type: none"> • Improved attitude toward medication safety • Increased awareness of safety aspects | <p>Trustworthiness: Moderate</p> <p>Strengths:</p> <ul style="list-style-type: none"> • Member checking used to evaluate responses • De-briefing session • Recording and verbatim transcription • Prolonged engagement <p>Limitations:</p> <ul style="list-style-type: none"> • Lack of detail about data saturation • No evidence of triangulation |
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Note. ADE: Adverse Drug Effect; BN: Bachelor of Nursing; CT: Control; DC: Discharge; INT: Intervention; MAP: Medication Administration Procedure; ME: Medication Error; MET: Medical Emergency Team; MR; Medication Reconciliation 115

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| <p>Authors: Goodwin et al. (2022)</p> <p>Design: Phenomenological</p> <p>Purpose: To understand student nurses' views of a medication management workshop</p> | <p>N: 32 fourth year nursing students</p> <p>Country/Setting: Europe/ nursing school</p> <p>Data Collection:</p> <ul style="list-style-type: none"> • Focus groups • Semi-structured interview guide <p>Outcomes:</p> <ul style="list-style-type: none"> • Developing confidence • Reflective learning • Enhanced awareness <p>Analysis:</p> <ul style="list-style-type: none"> • Reflexive thematic analysis | <p>Developing Confidence</p> <ul style="list-style-type: none"> • Reflected on lack of competence • Able to identify knowledge deficits • Increased communication with service users <p>Reflective Learning</p> <ul style="list-style-type: none"> • Enjoyed active/participatory learning • Able to relate knowledge to clinical practice • Vast amount of knowledge gained <p>Enhanced Awareness</p> <ul style="list-style-type: none"> • Clarity about reporting • Able to acknowledge the importance of safe medication practices | <p>Trustworthiness: High</p> <p>Strengths:</p> <ul style="list-style-type: none"> • Data saturation • Triangulation • Audit trail • Recording and verbatim transcription • Transcription rigor |
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| <p>Authors: Kuppadakkath et al. (2022)</p> <p>Design: Phenomenological</p> <p>Purpose: To explore nurses' experiences of MEs and suggestions to reduce these errors in residential aged care facilities</p> | <p>N: 12 Registered Nurses (Residential Aged Care Facilities)</p> <p>Country/Setting: Victoria, Australia/ Residential Aged Care Facilities</p> <p>Data Collection: Semi-structured interviews</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Psychological Impact <p>Analysis:</p> <ul style="list-style-type: none"> • Thematic analysis | <p>Psychological Impact</p> <ul style="list-style-type: none"> • Difficulty engaging with patients • Frustrated • Stressed • Leaving Job • Dissatisfied family members | <p>Trustworthiness: High</p> <p>Comments:</p> <ul style="list-style-type: none"> • Use of codebook • Audit trail • Interview guide • Data saturation • Triangulation |
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| <p>Authors: Athanasakis (2019)</p> <p>Design: Meta-Synthesis</p> <p>Purpose: To examined nurses' lived experiences of MEs</p> | <p>N: 8 studies (nurses who experienced MEs; >6 months experience)</p> <p>Country/Setting: United Kingdom/Nottingham University Hospital</p> <p>Data Collection: Interviews, group discussions</p> <p>Outcomes:</p> <ul style="list-style-type: none"> • Moral Impact • Emotional Impact <p>Analysis:</p> <ul style="list-style-type: none"> • Thematic Analysis | <p>Moral Impact:</p> <ul style="list-style-type: none"> • Unsure whether to report or not • Professional identity impacted • Feelings of guilt <p>Emotional Impact:</p> <ul style="list-style-type: none"> • Fear • Anger • Stress • Trauma • Suicide | <p>Strength of Design: Strong</p> <p>Quality: High</p> <p>Comments:</p> <ul style="list-style-type: none"> • Comprehensive search for literature • Clear interpretation of findings • Rigorous review process |
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Appendix C: Consultation Report

Development of a Medication Management Program for Developmental Support Workers

Consultation Report

Medication errors are a common health care issue which can have negative consequences on patients, nurses, and the healthcare system (Godfrey et al., 2013). This includes increased length of stay for patients, increased healthcare costs, and poor caregiver mental health (McCarthy et al., 2017; Sim et al., 2022; Treiber & Jones, 2018). However, these negative consequences of medication errors can be prevented through effective management of medication. Medication management is a part of client-centered care and involves more than just the administration of medication, but instead a combination of knowledge, skill, critical thinking, and decision-making (The College of Registered Nurses of Newfoundland and Labrador [CRNNL], 2019). Two high-quality randomized controlled trials (RCT) examined the effectiveness of medication management training among nursing students ((Mariani et al., 2017, Vital & Nathanson, 2023). The authors of both studies found statistically significant results associated with medication knowledge/skills and simulation among the intervention groups after the training. For instance, Mariani et al. (2017), reported that there was a statistically significant difference between the number of students who passed the medication skills knowledge assessment in the group who received two simulations (57%), compared to the group who only received one simulation (28%) ($p=.02$). Furthermore, the group with two simulations also scored significantly higher in medication safety critical element checklist (70.4%) compared to the group with one simulation (56.1%) ($p=.028$). Similarly, Vital and Nathanson (2023) found that the group who received two PowerPoint presentations had a shorter return time (seconds) to primary task (medication administration) in simulation two versus the group who only had one PowerPoint presentation (11.9 vs 18.9, respectively) ($p=.007$). The training in both studies was

delivered via various methods including simulation, lecture, and case scenarios. In relation, Dubovi et al. (2017) also found a statistically significant difference in overall mean knowledge pre-and post-test scores between the group who received virtual simulation training (55 vs 93) versus normal lectures (51 vs 52) ($p < 0.001$). Additionally, the mean pre and post-test score for basic procedural concepts for the simulation group were 67 vs 98, compared to 65 vs 57 in the normal lecture group ($p < 0.001$, which was also considered statistically significant).

Although medication management training has been shown to be effective in preventing medication errors in healthcare workers, various types of caregivers such as unlicensed caregivers (i.e., home support workers [HSWs], developmental support workers [DSWs]) do not receive the same level of medication management training as a licensed caregiver. As a result, medication errors could be a common issue among this population (Berland & Bentsen, 2017; Burgdorf et al., 2022; Godfrey et al., 2013). For instance, at Momentum Developmental Support, DSWs only receive one hour of medication management training during their orientation. This may not be enough time to ensure that DSWs have the necessary knowledge and skills to manage medications effectively. In addition, many of the DSWs at Momentum are international students who may not have the knowledge and skills related to medication management, as they have no medical background, and they are not familiar with the process of medication administration in Canada. The purpose of this project is to develop a medication management program to 1) increase medication management knowledge and skills among DSWs, 2) improve medication management practices among DSWs, and 3) reduce medication errors at Momentum Developmental Support. This medication management program will be developed based on the findings from the literature review, consultations plan, and environmental scan.

To support the development of this resource, consultations were completed with

managers and DSWs at Momentum Developmental Support using an online questionnaire. The goal of the consultations was to determine if a medication management program is necessary, the level of training that is required, and the preferred mode of delivery. In this report, I will present the findings from the consultations with DSWs and managers at Momentum Developmental Support. I will discuss the results of the qualitative and quantitative data, and implications for this data.

Specific Objective(s) for the Consultations

There were five specific objectives for these consultations:

1. Explore employees' (i.e., DSWs & managers) opinions about medication management training at Momentum Developmental Support.
2. Examine employees' perceptions about the need for a medication management educational resource.
3. Explore current medication management practices among employees.
4. Determine the learning needs of employees.
5. Identify the preferred mode of delivery for this program.

Sample & Methods

The sample for these consultations involved three managers and 28 DSWs at Momentum Developmental Support among three regions in Newfoundland (Western, Eastern, Northern Peninsula). It was important to consult the DSWs as they are the target population for the development of this program. Their feedback is to take into consideration when determining content and mode of delivery for this program. The managers also needed to be consulted because they are responsible for ensuring medication management practices are followed diligently. Furthermore, they can access medication incident reports and determine root causes for any medication errors. As a result, managers can provide valuable input regarding the

educational content by identifying medication management practices that are not being followed properly and outlining aspects of medication management that require further training.

Data Collection

It was noted by a member of the management team at Momentum Developmental Support that previous online questionnaires had a low response rate (less than 20%); therefore, the use of a large sample was necessary to ensure enough data was collected. This also helped provide diverse perspectives which is essential for designing an educational resource to meet the needs of all employees.

Data was collected using a questionnaire. This questionnaire was developed using Microsoft Forms and consisted of four closed-ended and 14 open-ended questions based on my consultation plan objectives. The questionnaire was developed on Microsoft Forms and the online link for the questionnaire was sent via email to the training manager. The training manager emailed the link to all managers and DSWs at Momentum. Employees who volunteered to complete the questionnaire clicked the online link and completed the questionnaire which took approximately 15 minutes. A total of 275 surveys were distributed to DSWs and managers at Momentum, and only 31 completed the online survey. Once questionnaires were completed, responses were available for me to view in Microsoft Forms. The link for the questionnaire remained open for 24 hours. To ensure quality of data, the questionnaire was set up so consultants could only view their own responses. This was done when developing the questionnaire, by enabling permissions in Microsoft Forms. This minimized the risk of response bias. In addition, the questionnaire was anonymous, and did not include any personal information. A copy of the survey can be found in Appendix A of this report and the letter that accompanied the surveys can be found in Appendix B.

Data Management and Analysis

Quantitative data was managed using Microsoft Forms, while qualitative data was managed using Excel. Microsoft Forms automatically analyzed answers for closed-ended questions on the questionnaire and provided a response summary using descriptive statistics, which was discussed in the results section. Data from the open-ended questions was manually input into excel and analyzed using content analysis (Bengtsson, 2016). First, the open-ended responses from the questionnaire were transferred from Microsoft forms to Excel. The responses were carefully analyzed to determine meaning units and condensed meaning units with a description close to text. Condensed meaning units were carefully reviewed to identify sub-themes. Finally, common themes were established based on the sub-themes.

Results

Overall, there were 31 employees who chose to volunteer to complete the questionnaire, yielding a low response rate of 11%. Of these participants, 28 (90%) were DSWs and three (10%) were managers at Momentum Developmental Support. As noted in Table 1, the majority of participants were from the eastern region (58%), while the rest were from the western region (35.5%) or preferred not to say (6.5%). Furthermore, 32% of employees had <1 year experience, and 32% had 1-5 years experience. The most reported education level was a college diploma (48%) followed by a bachelor's degree (23%). The results below reflect the quantitative and qualitative findings from DSWs and managers at Momentum Developmental Support.

Table 1

Participants' Characteristics

| | |
|---------------------------------------------|----------|
| <u>Participants' Characteristics</u> | (31) 11% |
|---------------------------------------------|----------|

| <u>Position at Momentum Developmental Support</u> | |
|----------------------------------------------------------|------------|
| Managers | (3) 10% |
| Developmental Support Workers | (28) 90% |
| <u>Regions of Work</u> | |
| Eastern | (18) 58% |
| Western | (11) 35.5% |
| Prefer not to say | (2) 6.5% |
| <u>Level of Education</u> | |
| College Diploma | (15) 48% |
| Bachelor's Degree | (7) 23% |
| <u>Years of Experience</u> | |
| < 1 year | (10) 32% |
| 1-5 years | (10) 32% |

Quantitative Results (DSWs and Managers)

As shown in Table 2, the majority of participants (90%) who completed this questionnaire were DSWs, while only 10% were managers. This was beneficial as the medication management program is tailored to the DSW population. Many DSWs rated the current medication management training at Momentum as good (46%) or excellent (39%), while all managers (100%) rated it as fair. It was noted by 71% of DSWs that the current medication training at Momentum adequately prepares employees to perform medication management skills. In comparison, 66% of managers indicated that the orientation at Momentum does not adequately prepare employees to perform medication management skills. The majority of DSWs

reported feeling very comfortable engaging in medication tasks such as medication preparation (75%), administration (82%), documentation (82%), and storage (85%). However, 66% of managers reported a lower comfort level (somewhat comfortable) for medication preparation, administration, documentation, and storage. While 28% of DSWs had made one or two medication errors while working at Momentum, 44% indicated that it was very unlikely these medication errors were related to lack of medication management training. Similarly, 33% of managers reported making a medication error while working at Momentum, and all managers (100%) noted that a lack of proper medication training was very unlikely associated with these errors. Overall, 46% of DSWs reported experiencing a co-worker make a medication error, with two or three times being the most common occurrence of these errors (42%). Meanwhile, all managers (100%) indicated that they experienced a co-worker make a medication error at least once (66%).

Table 2

Medication Management Program (DSWs and Managers)

| <u>Questions</u> | <u>DSWs</u> | <u>Managers</u> |
|--------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------|
| | (28) 90% | (3) 10% |
| <u>Current Medication Management Training Rating</u> | | |
| Good | (13) 46% | (0) 0% |
| Excellent | (11) 39% | (0) 0% |
| Fair | (0) 0% | 3 100% |
| <u>The current medication management training adequately prepares employees to perform medication management skills</u> | | |

| | | |
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| Agree | (20) 71% | (1) 34% |
| Disagree | (9) 29% | (2) 66% |
| <u>Feel very comfortable engaging in the following medication tasks</u> | | |
| Medication Preparation | (21) 75% | (0) 0% |
| Medication Administration | (23) 82% | (0) 0% |
| Medication Documentation | (23) 82% | (0) 0% |
| Medication Storage | (24) 85% | (0) 0% |
| <u>Feels somewhat comfortable engaging in the following medication tasks</u> | | |
| Medication Preparation | (0) 0% | (2) 66% |
| Medication Administration | (0) 0% | (2) 66% |
| Medication Documentation | (0) 0% | (2) 66% |
| Medication Storage | (0) 0% | (2) 66% |
| <u>Medication errors while working at Momentum</u> | | |
| One or two | (8) 28% | (1) 33% |
| <u>Employees who think medication errors made were not related to medication management training</u> | | |
| | (13) 44% | (3) 100% |
| <u>Experienced a co-worker make a medication error</u> | | |
| | (13) 46% | (3) 100% |
| <u>Number of Times witnessed co-worker make an error</u> | | |
| Two or Three Times | (13) 42% | (0) 0% |
| At least once | (0) 0% | (2) 66% |

Qualitative Results (DSWs)

Qualitative data analysis was conducted using Bengtsson (2016) content analysis method. There were four common themes identified among the open-ended questions completed by DSWs. Interestingly, the findings from the qualitative data were not consistent with the quantitative data. The qualitative data illustrated a greater need for a medication management program at Momentum than the quantitative data. The four common themes identified were safe medication procedures, DSW knowledge and competence, educational strategies, and classroom-based learning.

Safe Medication Procedures

Safe medication procedures were a common theme identified by DSWs used to define medication management. There were many similar responses related to aspects of medication management such as proper storage, labelling, administration, documentation, and monitoring patient outcomes. Additionally, there was a focus on the eight rights of medication administration and the importance of following these rights when engaging in medication management skills to ensure patient safety and avoid medication errors. There was a common connotation that engaging in safe medication procedures was the key to effective medication management. One DSW stated, “It’s important to administer to the right patient, right drug, right time, right dose because we are responsible for our client’s wellbeing”. Another DSW indicated that “medication management is the proper protocol for preparing, administering, and documenting the proper medications so our client’s get the proper care”. The recurrence of this theme throughout the data indicates that DSWs have an accurate understanding of medication management. Additionally, this theme is consistent with the literature which indicates that medication management involves several procedures such as selection, delivery, administration, documentation, and monitoring of medication to ensure high-quality patient care and safety

(Bakhshi et al., 2021).

DSW Knowledge and Competence

The second common theme, DSW knowledge and competence, was related to the need for a medication management program at Momentum. The majority of DSWs agreed that a medication management program was necessary at Momentum because many DSWs lack knowledge and competence related to medications. A DSW stated, “yes, new hires or people who may be incompetent may need the training program. Also, people who have been working awhile, a refresher is most definitely needed”. Similarly, another DSW responded, “yes, I believe no one understand the medications, what they do, and proper storage”. Specifically, there were concerns about new DSWs and their ability to safely prepare, administer and document medication without assistance from a senior DSW. In relation, DSWs reported that a medication management program would increase knowledge and competence, as well as confidence. Similar findings were reported in Godfrey et al. (2013) and Parand et al. (2016) which indicated lack of knowledge and competence as a contributing factor for a wide range of medication errors (12%-92.7%) among unlicensed caregivers (i.e., DSWs).

Educational Strategies

Incorporating a variety of educational strategies was a common theme that was identified related to content that should be included in a medication management program. While participants focused more on the strategies used to deliver the content, there were a couple suggestions related to individual content. This included hands-on content such as proper administration and documentation procedures, as well as lecture content such as proper packaging and preservation of medication, and common uses/side effects of medication. Participants were interested in the educational techniques used to deliver content, as opposed to

the individual medication management content. However, this finding is important to take into consideration when planning educational content. One DSW reported that “hands-on practice” was needed, whereas another DSW stated “more awareness about the usage and intensity of certain medications so that we know if a particular medication is skipped mistakenly, how much disturbance it can cause to the client”. Goodwin et al. (2022) reported comparable findings from students who attended a medication management workshop which involved a variety of educational strategies (i.e., lecture and problem-based learning). Students enjoyed having practical and theoretical components implemented into the workshop, as well as several educational strategies. This also had a positive impact on student competence in relation to medication management.

Classroom-Based Learning

Classroom-based learning was the final common theme identified by DSWs which was connected to how they learn best. The majority of participants reported that they enjoy learning via face-to-face interaction or in a classroom. DSWs stated, “I would like to learn in a classroom setting” and “I am interested in learning face-to-face with a specialist, if that is possible”. This was closely related to the educational strategies theme, as DSWs wanted content that could be implemented using a variety of educational methods, which typically works best in a classroom setting. Moreover, DSWs indicated that they like having access to paper resources which are often distributed during classroom training sessions. Comparably, Oducado et al. (2021) noted that many caregivers prefer to learn face-to-face, as online learning is stressful and has a negative impact on academic performance. Furthermore, there is low satisfaction associated with online learning.

Qualitative Results (Managers)

Qualitative data analysis was conducted using Bengtsson (2016) content analysis method. There were three common themes identified among the open-ended questions that were completed by managers. These themes support the findings from the quantitative data indicating that changes are needed to further improve the current medication management training at Momentum. The three common themes identified were *safe medication skills, standardized procedures, and experiential learning*.

Safe Medication Skills

Similar to the DSW findings, safe medication skills was a common theme that occurred when managers were asked to define medication management. Common answers were provided such as safe storage, administration, documentation, and monitoring of medications. One manager stated that medication management involves “managing the safe storage, administration, and documentation of client’s medications”. In relation, another manager stated, “proper storage, labeling, administration, and documentation”. All managers reported on the skills required for medication management with an emphasis on safety when engaging in these skills. These responses indicates that managers are able to comprehend the various aspects of medication management. These findings were consistent with the definition of medication management provided by CRNNL (2019) which indicates that medication management involves more than just the administration of medication, but instead a combination of knowledge, skills, and critical thinking to ensure safe client-centered care.

Standardized Procedures

Standardized procedures was a common theme related to the need for medication management training at Momentum. All managers indicated that a medication management training program is needed due to lack of efficient and standardized training. In relation, many

noted that the lack of standardized procedures contributes to confusion during medication training; therefore, leading to medication errors which can have long-lasting impacts on clients. A Managers stated, “yes, I think it needs to be a standardized procedure which is simple, safe, and effective. Currently too many steps in the procedure are what causes the errors because no one will ever spend the time to go through each step. Hence why it needs to be safe, simple, but efficient”. Another manager responded, “yes, medication is the most important part of many of our client’s behavioral management. Missed doses, incorrect doses, or improper administration can likely cause serious long-lasting harm to our clients”. It was evident that implementation of standardized training procedures would allow for simplicity in medication management training; thus, improving medication management procedures. Erickson et al. (2020) reported that many unlicensed caregivers have trouble understanding complex drug regimens; therefore, they require simplified training. In relation, Berland and Bentsen (2017) found that medication management training in home care is not held to high standards. As a result, there are inconsistencies noted in training due to a lack of standardized procedures (Godfrey et al., 2013).

Experiential Learning

Experiential learning was a common theme related to what managers felt should be included in a medication management training program and how they would like to learn. Recurrent suggestions for content to include in a medication management training program reflected that participants want more “experience by doing” as they proposed content which focused on documentation, hands-on learning, and protocols for common clinical situations (i.e., medication is missing from blister pack). One manager suggested, “a focus on how to management medication that may not come in standard blister packs. Proper protocols for if a medication goes missing, or if you find a wrong type of medication in what was delivered”. In

relation, all managers reported they would like to learn about medication management in a classroom setting to engage in discussion, ask questions, etc., which is also linked to experiential learning. Another manager indicated that training should involve “a dedicated orientation session conducted by someone who has been extensively trained to teach proper medication management”. This theme is consistent with findings from the literature as Vital and Nathanson (2023) used experiential learning methods (i.e., lecture, simulation, problem-based learning) for medication management training and noted statistically significant results.

Ethical Considerations and Confidentiality

To complete the online questionnaire, permission was obtained from the training manager at Momentum Developmental Support. Participation was voluntary; therefore, those who completed the questionnaire indicated their consent. To ensure confidentiality and data security, responses were anonymous, no personal information such as names were collected, and data was stored in a password protected file on my computer. In addition, the information was used solely for the development of this practicum project, and only shared with my supervisor. When the practicum project was completed, this file was permanently deleted from my computer. The Health Research Ethics Authority (HREA) screen tool has been completed (refer to Appendix C), and based on the assessment, this project is deemed exempt from Health Research Ethics Board approval. It falls under the category of a quality improvement initiative within the normal scope of educational standard.

Implications for the Practicum Project

While the response rate for this survey was quite low, it is the typical response rate for questionnaires distributed at this agency. Despite inconsistencies among some of the data, it is evident that there is room for improvement for medication management training at Momentum.

The implication of these findings suggests that there is a different perception of the need for a medication management training program between managers and DSWs. However, despite inconsistencies among some of the quantitative data, the qualitative data suggests that the medication management training at Momentum is not flawless, and there is room for improvement. These findings can help me tailor the medication management program to ensure it is beneficial for these DSWs. For example, the themes identified through the qualitative data identified that participants prefer classroom training that involves a variety of educational strategies and experiential learning. This will help me plan activities and content that can be delivered using these methods (i.e., simulation, case scenarios, reflection exercises). In relation, the quantitative data illustrated that medication errors are a common occurrence among many employees at this agency. This allows me to understand the extent of the medication management issues and can help me focus the content of this program (i.e., ensuring medication checks are completed before administering, how to document a medication error). These findings will also be compared to the findings from the literature review and environmental scan to identify similarities and differences, which will aid in the overall development of the medication management program.

Conclusion

There were some similarities and differences in the results of the questionnaire for managers and DSWs. As the role of a manager and front-line employee (DSW) are quite different, it is not surprising that there would be differing opinions and experiences. Overall, the most differences were noted among the quantitative data collected from DSWs and managers. Quantitative data collected from DSWs indicated that the current medication management program at Momentum is adequate to meet employee and client needs, and many DSWs feel

very comfortable engaging in medication management skills. Meanwhile, the quantitative data collected from managers indicated a slightly lower comfort level when engaging in medication management skills, and a need for further improvement in the medication management training offered at Momentum. As managers do not engage in medication management skills daily, this may be related to the lower confidence level. However, managers have access to more information (i.e., incident reports) which may account for the differences in perception of the need of a medication management program.

There were many similarities noted among the qualitative data from managers and DSWs. While there were different themes uncovered between both groups, collectively, these themes illustrate the need for a medication management program at Momentum. It was evident that all employees have an accurate understanding of what medication management entails, but DSWs lack the knowledge and competence to perform these skills and there is currently a lack of standardized training. Furthermore, all employees emphasized the importance of having a medication management training program that meets a variety of needs by incorporating components of the experiential learning theory and several educational strategies in a classroom-based setting. The goal of this project is to use these findings to develop a medication management program that eliminates the gaps of the current training program and provides consistency for DSWs.

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Appendix A : Medication Management Questionnaire

Part A

Please answer the following questions:

1. What is your position at Momentum Developmental Support?
 - Manager
 - Developmental Support Worker
2. Which region do you work?
 - Western region
 - Eastern region
 - Northern Peninsula
 - Prefer not to say
3. What is your highest level of education achieved?
 - High school diploma or equivalent
 - College Diploma
 - Bachelor's degree
 - Master's Degree
 - Other (please specify) _____
4. How long have you worked at Momentum Developmental Support?
 - 1 year or less
 - 1-5 years
 - 5-10 years
 - 15 or more years

5. How would you rate the current medication management training at Momentum

Developmental Support?

Excellent

Good

Undecided/ Unsure

Fair

Poor

6. How comfortable do you feel engaging in medication preparation?

Extremely comfortable

Somewhat comfortable

Undecided/Unsure

Somewhat uncomfortable

Very uncomfortable

7. How comfortable do you feel engaging in medication administration?

Extremely comfortable

Somewhat comfortable

Undecided/Unsure

Somewhat uncomfortable

Very uncomfortable

8. How comfortable do you feel engaging in medication documentation?

Extremely comfortable

Somewhat comfortable

Undecided/Unsure

Somewhat uncomfortable

Very uncomfortable

9. How comfortable do you feel engaging in medication storage?

Extremely comfortable

Somewhat comfortable

Undecided/Unsure

Somewhat uncomfortable

Very uncomfortable

10. Do you feel the orientation at Momentum Developmental Support adequately prepares employees to perform medication management skills?

Yes

No

Undecided/ Unsure

11. How many medication errors have you made while working at Momentum

Developmental Support? (Note: if you have made a medication error, please answer question #12 as well)

None

1-3

3-5

5+

12. If you have made a medication error(s) while working at Momentum Developmental Support, how likely is it that a lack of proper medication management training was a contributing factor to this error(s)?

- Extremely likely
- Somewhat likely
- Undecided/Unsure
- Somewhat likely
- Very unlikely

13. Have you ever experienced a co-worker make a medication error while working at Momentum Developmental Support? (Note: if you answer yes to this question, please answer question #14 as well)

- Yes
- No

14. How often have you experienced a co-worker make a medication error while working at Momentum Developmental Support?

- Once
- 2-3 times
- 4-5 times
- More than 5 times

Part B

15. What does medication management mean to you?

16. Do you think a medication management educational program is needed at Momentum Developmental Support? Please explain why or why not.

17. What would you like to see included in a medication management educational program?

18. How would you like to learn about medication management?

Thanks for agreeing to participate in this project!

Appendix B: Example of Recruitment Letter

Dear Managers/DSWs,

My name is Julia and I am a student in the Master of Science in Nursing program at Memorial University, Faculty of Nursing. I am currently in the process of completing my practicum project, which involves the development of a resource. I plan to develop a medication management program for developmental support workers (DSWs) at Momentum Developmental Support. The main goal of this project is to improve the medication management skills of the DSWs; thus, improving the quality of care provided to clients. Through a recent review of the literature, I found that medication management training and education has a significant impact on preventing medication errors, which relates to patient safety. Consulting with employees at Momentum will allow me to determine if there are consistencies between the literature and this agency.

I am writing you today to ask if you would like to take part in this project by completing an online questionnaire. The purpose of the questionnaire is to gather some information regarding the current medication management training available to DSWs, and the type of educational content you would like included in a medication management program. The questionnaire will be completed online using Microsoft Forms and should only take approximately 15 minutes to complete. All responses will be anonymous. The information gathered from this questionnaire will only be reviewed with my supervisor, The results of the questionnaires will be shared in my practicum report, without any identifying information. I aim to start the consultation process around July 10th, 2023 and appreciate you taking the time to complete this questionnaire. If you have any questions, do not hesitate to contact me at any time. I look forward to hearing from you.

Sincerely,

Julia Bennett, BNRN

Registered Nurse, Momentum Developmental Support

MScN Student, Memorial University of Newfoundland

709-640-9484

jeb524@mun.ca

Appendix C: Health Research Ethics Authority (HREA) Screening Tool

Student Name: Julia Bennett

Title of Practicum Project: Development of a Medication Management Program for Developmental Support Workers

Date Checklist Completed: June 2, 2023

This project is exempt from Health Research Ethics Board approval because it matches item number 3 from the list below.

1. Research that relies exclusively on publicly available information when the information is legally accessible to the public and appropriately protected by law; or the information is publicly accessible and there is no reasonable expectation of privacy.
2. Research involving naturalistic observation in public places (where it does not involve any intervention staged by the researcher, or direct interaction with the individual or groups; individuals or groups targeted for observation have no reasonable expectation of privacy; and any dissemination of research results does not allow identification of specific individuals).
3. Quality assurance and quality improvement studies, program evaluation activities, performance reviews, and testing within normal educational requirements if there is no research question involved (used exclusively for assessment, management or improvement purposes).
4. Research based on review of published/publicly reported literature.
5. Research exclusively involving secondary use of anonymous information or anonymous human biological materials, so long as the process of data linkage or recording or dissemination of results does not generate identifiable information.
6. Research based solely on the researcher's personal reflections and self-observation (e.g. auto-ethnography).
7. Case reports.
8. Creative practice activities (where an artist makes or interprets a work or works of art).

For more information please visit the Health Research Ethics Authority (HREA) at <https://rpresources.mun.ca/triage/is-your-project-exempt-from-review/>

Appendix D: Environmental Scan Report

Development of a Medication Management Program for Developmental Support Workers

Environmental Scan Report

Medication errors are a common healthcare issue worldwide which have many negative impacts on patients, caregivers, and the healthcare system (Godfrey et al., 2013). This includes increased length of stay for patients, increased healthcare costs, and poor caregiver mental health (McCarthy et al., 2017; Treiber & Jones, 2018; Sim et al., 2022). These negative consequences of medication errors can be prevented with effective management of medications. Medication management is an important aspect of quality client-centered care which involves more than just the administration of medication, but instead a combination of knowledge, skill, critical thinking, and decision-making (The College of Registered Nurses of Newfoundland and Labrador [CRNNL], 2019). While mostly licensed professionals engage in medication management tasks in hospital-based care, most of community-based care is provided by unlicensed caregivers. Unlicensed caregivers are permitted to engage in medication management tasks with proper education and training (Shore et al., 2022). Although proper education and training is essential for client safety, medication management in home care is not held to high standards (Godfrey et al., 2013). As a result, caregivers are not educated about medication management properly and are at high risk of making medication errors (Burgdorf et al., 2022). This has a significant impact on client safety, putting them at risk of an adverse drug event (ADE) (Assiri et al., 2018).

At Momentum Developmental Support, unlicensed caregivers such as developmental support workers (DSWs) provide care for clients with intellectual disabilities. As part of onboarding and orientation, DSWs receive only an hour of medication management training. This is not nearly enough time or educational content to ensure DSW's are well versed in medication management. According to Harrison and Graham (2021), environmental scans are

used to identify any resources that may be available to guide strategies or interventions for a particular issue, and it also provides a way to customize best practice to a local context. The goal of this project is to create a medication management program for DSWs based on the experiential learning theory and Knowles' adult learning principles. The content and the mode of delivery of this program will be based on findings from a literature review, consultations, and an environmental scan.

The environmental scan was conducted to determine if there were any existing educational resources related to medication management being utilized by local community-care agencies. An additional purpose of the environmental scan was to identify the best possible format, implementation process, evaluation measures, and common content themes to help guide the development of a medication management workshop for developmental support workers at Momentum Developmental Support.

For this project, several local community-care agencies were consulted to determine current medication management practices, and if there were any available medication management resources. In addition, the director/manager of these community care agencies were asked about any barriers associated with any current medication management training. Furthermore, a review of the literature was completed to determine if there were any medication management resources available in Canada or Newfoundland and Labrador (NL). Completing an environmental scan through consults with local community-care agencies, examining the available resources, and reviewing the literature provided me with some resources that I can use for the development of the medication management program. In addition, the results of this environmental scan also allowed me to compare similarities and differences among these resources; therefore, determining the most appropriate ones to use for the development of this

project.

Specific Objective(s) for the Environmental Scan

There were three objectives for the environmental scan:

1. Identify existing medication management resources available within Newfoundland and Labrador or Canada
2. Consult with local community care agencies to determine if they have any medication management resources available
3. Analyze data collected from the environmental scan and use relevant information to inform project development
4. Identify the educational content and the mode of delivery for any medication management resources available.

Methods

Setting and Sample

The setting for this medication management project was Momentum Developmental Support located in St. John's and Corner Brook. The environmental scan involved searching the literature, consultations with two local community care agencies: Blue Sky Family Care and Parallel Health, as well as searching for resources provided by these community care agencies. The purpose and methods used in the environmental scan are provided in detail within this report. The data collected from the environmental scan was assessed using content analysis to identify themes (Bengtsson, 2016). To find medication management resources available in the literature, four websites with information pertaining to medication management in NL and Canada were searched. The websites are 1) The College of Registered Nurses of Newfoundland and Labrador (CRNNL) (2019), 2) The Institute for Safe Medication Practices (ISMP) Canada

(2020), 3) Alberta Health Services (2022) and 4) The College of Licensed Practical Nurses of Alberta (n.d.). The following key words were used: “*direct support professional*”, “*medication management*”, “*training programs*”, “*unlicensed caregiver*”, “*home support worker*”, “*workshop*”, “*education*”, and “*strategies*”. In addition to these four websites, two community care agencies were contacted for consultation including Blue Sky Family Care and Parallel Health. These organizations were chosen because they hire unlicensed caregivers, and they provide care for clients with intellectual disabilities. Therefore, any resources these agencies had available would likely be applicable to the employee and client population at Momentum Developmental Support. To consult with these agencies, an emailed letter was sent to the director/manager of each organization to inform them of my project and inquire about engaging in consultation via email or virtual meeting (See Appendix A).

Data Collection

Literature Search

For the purpose of this scan, data was collected from the literature search by searching four health-related websites in NL and Canada. While searching these websites, I looked for resources applicable to medication management including important medication management tips, medication management programs, information about medication management practices, learning activities, and case scenarios about medication errors/medication management. I focused my search on resources that could be adapted to unlicensed caregivers and the various levels of education among this population. Resources such as self-study medication management course and medication assistance program manual were obtained from the literature search of these four websites, whereas case-based scenarios were obtained from consultations with the two local community-care agencies (Blue Sky Family Care and Parallel Health).

Consultations with Community-Care Agencies

The information collected from community-care agencies was collected via email, as this was the preferred method by the director of both agencies (Blue Sky Family Care and Parallel Health). A questionnaire was used for these consultations (See Appendix B). The questionnaires were emailed to the directors to ask them about their current medication management training (i.e., mode of delivery, content included, barriers, and resources). To document my findings from the consultations, a copy of the emailed responses and any shared resources were saved in a password-protected file on my computer. These resources were able to be extrapolated to unlicensed caregivers and contained a variety of medication management information and educational strategies, which was pertinent to the development of my resource.

Data Management and Analysis

Literature Search

For data management of the resources obtained from the four above discussed websites and two community-care agencies, important aspects of the resources such as medication management tips and activities were highlighted. The highlighted aspects were then categorized in Excel, and themes were identified through content analysis (Bengtsson, 2016) (See Appendix C). Common themes from all resources were compared to identify which information may be the most beneficial to include in the medication management program.

Consultations with Local Community- Care Agencies

Data from consultations with two community-care agencies were analyzed using content analysis (Bengtsson, 2016). First, the responses from consultations with local community-care agencies were entered into Excel. Then I coded the responses according to meaning unit, and provided a condensed meaning unit that was close to the text. Through these condensed

meanings, sub-themes were identified. Finally, common themes were uncovered (See Appendix D). These common themes were used to identify current medication practices, mode of delivery, and barriers associated with medication training among these agencies.

Results

There were two themes identified through the resources obtained from the literature and community care agencies, and three themes identified through consultations with two local community care agencies.

Literature Review and Community Care Agency Resources Themes

There were two themes identified through the resources obtained from the literature search. These two themes are *educational strategies* and *lecture content*, which I discuss in the next section.

Educational Strategies

Data collected from The College of Licensed Practical Nurses of Alberta (n.d.) and Alberta Health Services (2022) had medication management resources that incorporated a variety of educational strategies. Resources obtained from The College of Licensed Practical Nurses of Alberta (n.d.) included a self-study module with activities such as simulation, problem-based learning, and quizzes. Meanwhile, a medication management program manual with case scenarios was obtained from Alberta Health Services (2022). These resources will help learners stay engaged and practice applying medication theory, instead of just learning about it.

Lecture Content

All the literature resources obtained had some information that could be used for lecture content. This includes information about the eight rights of medication administration, documentation, storage, etc. For instance, The College of Licensed Practical Nurses of Alberta

(n.d.) had several self-study modules that included information about medication tips, safety, etc., which could be incorporated into lecture content. Meanwhile, The College of Registered Nurses of Newfoundland and Labrador (CRNNL) (2019), The Institute for Safe Medication Practices (ISMP) Canada (2020), and Alberta Health Services (2022) also had resources with information related to medication administration, documentation, medication errors, etc. that would be important to include in a lecture for my medication management program.

Community-Care Agency Themes

There were three themes identified through the consultations with the two local community-care agencies (Blue Sky Family Care and Parallel Health). These three themes are *theoretical and practical learning, classroom-based learning, and difficulty with online learning.*

Theoretical and Practical Learning

Theoretical and practical learning was the first common theme identified through consultations with local community-care agencies. It was reported that both agencies have a medication management training program for employees which involves theory about medication management (i.e., rights of medication administration, documentation procedures), and practical skills (i.e., preparing and administering medication). One manager stated, “Employees are provided with both theory and practical training”.

In-Person Learning

In-person learning was the second most common theme identified through consultations with local community-care agencies. Both agencies reported that in-person learning is a component of their medication management training, specifically for practical skills. At Parallel Health, employees complete the theoretical component online and then meet with a nurse 1:1 to complete the practical skills (i.e., preparing, administering, and documenting medication). One

manager stated, “The theory consists of training modules followed by hands-on training with a nurse”. In comparison, Blue Sky Family Care employees must complete an online theory course and get 100% in the medication quiz before moving to the in-person learning session. During the in-person learning session, a lecture is used to review important theoretical material before completing practical skills. Another manager said, “this is completed in day two orientation so employees can practice hands on”. Employees are also provided with problem-based scenarios during the in-person learning session, so they can practice critical thinking skills.

Difficulty With Online Learning

The last common theme identified through consultations was difficulty with online learning, which was also considered a barrier. Both agencies commented on the difficulty employees have with online learning. This includes the amount of time it takes to complete the online course, lack of insight into questions that are wrong on the medication quiz, and no access to a trainer/manager to ask questions. One manager noted, “Some find the online course difficult as Practicare does not let them know which questions they have wrong on the test if they do not get 100% on the first try. This leads many to be agitated and second guess their answers”. Meanwhile, another manager stated, “depending on the complexity of the client and the learning needs of the trainee, the online learning can be cumbersome”.

Ethical Considerations

To obtain permission from local community care agencies, I had to contact the director of each agency via email to see if they were willing to share any resources with me. In this email I identified myself and informed them of my project. I asked if they would be willing to participate in a consultation with me via email or a virtual meeting to discuss medication management at their agency. I also disclosed information related to privacy and confidentiality in

this email. For any resources obtained from the literature, permission was assumed if it was publicly available. Consent for consultation was assumed by agencies who volunteered to participate and share resources. To ensure confidentiality and data security, participants were informed that the resources may be shared with my supervisor and used in the development of my practicum project, a password protected file would be used, and no identifying information would be disclosed. The Health Research Ethics Authority (HREA) screen tool was completed (See Appendix E) and this project was exempt from Health Research Ethics Board approval as it is part of a quality improvement project that is within normal educational standards.

Implications

There were several implications for the findings from the environmental scan. Consulting with Blue Sky Family Care and Parallel Health gave me some insight into other medication management programs, including areas of strength and opportunity for these programs. For instance, Blue Sky Family Care and Parallel Health have an online theoretical component; however, there are some barriers associated with having an online component, such as the inability to ask questions. Since online learning has been considered a barrier for these agencies, this helped me make a decision about the best mode of delivery for incorporating theoretical-based content into my program, such as a lecture. In addition, the results of this scan were compared to the literature review and consultations to identify similarities and differences. This helped me determine what resources were necessary to include for adequate training and education. For instance, content of my medication training program should include theory and practical skills. The theory should include information related to medication management (i.e., common medications, eight rights of medication administration, commonly confused medications), while the practical component should include preparing, administering, and

documenting medication as per the medication management programs at Blue Sky Family Care and Parallel Health. However, the educational strategies used to deliver this content will be different from these agencies. Instead, I will use strategies that ensure a variety of learning needs are met and keep employees engaged such as lectures, case-scenarios, and simulation, as these strategies have been shown to be effective for medication management training in the literature. As both agencies reported that it takes approximately 3-3.5 hours to complete medication management training, a half-day workshop will be sufficient to deliver this program.

Conclusion

The results of this environmental scan helped identify medication management resources that are available throughout the literature and two local community care agencies. The environmental scan gave me a vast range of resources to draw upon when developing the medication management program. The findings from the environmental scan also helped me identify similarities and differences in medication management training resources. As a result, similar resources and findings were used to inform the development of the medication management workshop for DSWs. As there is a lack of consistent medication management training among unlicensed caregivers, the findings from the environmental scan can help inform the development of this medication management workshop, which may be a leader in the transformation of training available to unlicensed caregivers. Developing an effective resource requires extensive knowledge and resources which is acquired from an environmental scan.

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<https://doi.org/10.1097/NAN.0000000000000273>

Appendix A: Letter for Community-Care Agencies

Dear (name of manager/director at each chosen agency),

My name is Julia and I am a student in the Master of Science in Nursing program at Memorial University. I am currently in the process of completing my practicum project, which involves the development of a resource.

Through a recent review of the literature, I found that medication management training and education has a significant impact on prevention of medication errors, which relates to patient safety. Therefore, I am planning to develop a medication management program for developmental support workers (DSWs) at Momentum Developmental Support. The main goal of this project is to improve the medication management training offered to DSWs; thus, improving the quality of care provided to clients.

Momentum Developmental Support provides 24-hour care to individuals with intellectual disabilities. I have noted that your agency offers similar community-based care. As a result, I am wondering if you have any medication management resources available that you would be willing to share with me. In addition, I would like to know about the current mode of delivery for any medication management training offered at your agency, as well as any identified barriers. Any information or resources you have will be beneficial to the development of this program. We can consult via email or virtually, depending on what works best for you. This is an informal discussion and should only take approximately 15-20 minutes.

The information gathered will be reviewed with my supervisor, and may be shared in my practicum report, without any identifying information. The information will be kept in a password protected file on my computer and deleted upon completion of my practicum project. Please let me know at your earliest convenience if you are willing to participate in this discussion. If you have any questions, do not hesitate to contact me at any time. I look forward to hearing from you.

Sincerely,

Julia Bennett, BNRN

Registered Nurse, Momentum Developmental Support

MScN Student, Memorial University of Newfoundland

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Appendix B: Consultation Questions for Local Community Care Agencies

1. Do you have a medication management training program for employees?
2. What content is included in your medication management training for employees?
3. What mode of delivery is used to deliver this training?
4. How long does it take to delivery your medication management training?
5. Are there any barriers identified with the current medication management training offered at your agency?
6. Do you have any medication management resources you would be willing to share for the development of a medication management program for developmental support workers at Momentum Developmental Support?

Appendix C: Example of Content Analysis for Literature Search and Resources Obtained from Community Care Agencies

The screenshot shows an Excel spreadsheet with the following data:

| | A | B | C | D | E | F |
|---|-----------------------------------------------------|--------------------------------------|-------------------------------------------|--------------------------------------------|---|---|
| 1 | Literature Resource/ Community-Care Agency | Resource | Category | Theme(s) | | |
| 2 | The College of Licensed Practical Nurses of Alberta | Self-study modules, games, quizzes | Theoretical Content | Educational Strategies and Lecture Content | | |
| 3 | Alberta Health Services | Medication Management Program Manual | Theoretical Content | Lecture Content | | |
| 4 | Blue Sky Family Care | Slideshow and Scenarios | Theoretical Content and Practical Content | Educational Strategies and Lecture Content | | |

Appendix D: Example of Content Analysis for Community Care Consultations

| | A | B | C | D | E | F |
|---|------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------|------------------|------------------------------------|---|
| 1 | Community-Care Agency | Meaning Unit | Condensed Meaning Unit Description Close to Text | Sub-Theme | Theme | |
| 2 | Blue Sky Family Care | Employees have to complete the medication training online before classroom training | There is online and classroom training | Content | Theoretical and Practical Learning | |
| 3 | Parallel Health | The theory consists of training modules followed by hands-on training with a nurse | There are online training and training with a nurse | Mode of Delivery | In-Person Learning | |
| 4 | Parallel Health | The online learning can be cumbersome depending on the needs of the trainee | Online learning can be challenging for some employees | Frustration | Diffulty With Online Leaning | |

Appendix E: Health Research Ethics Authority (HREA) Screening Tool

Student Name: Julia Bennett

Title of Practicum Project: Development of a Medication Management Program for Developmental Support Workers

Date Checklist Completed: June 2, 2023

This project is exempt from Health Research Ethics Board approval because it matches item number 3 from the list below.

1. Research that relies exclusively on publicly available information when the information is legally accessible to the public and appropriately protected by law; or the information is publicly accessible and there is no reasonable expectation of privacy.
2. Research involving naturalistic observation in public places (where it does not involve any intervention staged by the researcher, or direct interaction with the individual or groups; individuals or groups targeted for observation have no reasonable expectation of privacy; and any dissemination of research results does not allow identification of specific individuals).
3. Quality assurance and quality improvement studies, program evaluation activities, performance reviews, and testing within normal educational requirements if there is no research question involved (used exclusively for assessment, management or improvement purposes).
4. Research based on review of published/publicly reported literature.
5. Research exclusively involving secondary use of anonymous information or anonymous human biological materials, so long as the process of data linkage or recording or dissemination of results does not generate identifiable information.
6. Research based solely on the researcher's personal reflections and self-observation (e.g. auto-ethnography).
7. Case reports.
8. Creative practice activities (where an artist makes or interprets a work or works of art).

For more information please visit the Health Research Ethics Authority (HREA) at <https://rpresources.mun.ca/triage/is-your-project-exempt-from-review/>

Appendix E: Medication Management Resource



MEDICATION MANAGEMENT FOR DEVELOPMENTAL SUPPORT WORKERS

Workshop Instructor Manual

Julia Bennett BN RN

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Introduction

Medication errors are a worldwide health care issue which poses a risk to patients, caregivers, and the healthcare system (Godfrey et al. 2013). Effective management of medications can prevent medication errors and the negative consequences associated with these errors. Although unlicensed caregivers are permitted to engage in medication management tasks with proper education and training (Shore et al., 2022), education and training in the home care setting is not held to high standards (Godfrey et al., 2013). As a result, caregivers are not educated about medication management properly and are at high risk for making medication errors (Burgdorf et al., 2022).

At Momentum Developmental Support, unlicensed caregivers called developmental support workers (DSWs) provide care for clients with intellectual disabilities. As part of onboarding and orientation, DSWs receive only an hour of medication management training. This is a gap in training as it is not nearly enough time or educational content to ensure DSW's are well versed in medication management.

The Half-Day Workshop

The half-day workshop “Medication Management for Developmental Support Workers” was designed for DSWs at Momentum. This workshop was developed based on Knowles’ (1978) adult learning theory and Kolb’s (1984) experiential learning theory. A variety of educational strategies were incorporated into this workshop such as:

1. Lecture
2. Case Studies

3. Simulation

The overall goal is to provide an interactive training session that would assist DSWs in the development of medication management skills. Three learning objectives are considered to achieve this goal:

1. Discuss the importance of proper medication management
2. Demonstrate practical medication management skills
3. Identify the appropriate action(s) to take when a medication management issue is encountered

Notification of Training

- An email outlining details of the workshop (Appendix A) will be sent by the training manager to all participants registered for each workshop. This email will contain details about the location, time, instructor, etc.

Number of Participants

- To ensure efficient learning, the workshop is designed for a maximum of 12 participants and a minimum of 4 participants. Each participant will be required to sign the attendance sheet to be paid (Appendix B).

Workshop Instructors

- A nurse or another professional who has a clinical background should deliver this workshop. New instructors are required to attend a workshop prior to instructing to ensure consistent teaching. The resource manual provides detailed descriptions of each learning activity. Before each workshop, the instructor should thoroughly review the resource manual and the PowerPoint (Appendix C).

Time of the Workshop

- Training will be offered on a monthly basis to ensure all DSWs have the opportunity to attend. The training will be offered from 9 am- 12:30 pm, with a 20-minute coffee break throughout and an additional 10-minute break.

Theoretical Frameworks

There were two theories (Knowles' (1978) adult learning theory and Kolb's (1984) experiential learning theory) used to guide the development of this manual, as well as the selection of educational strategies.

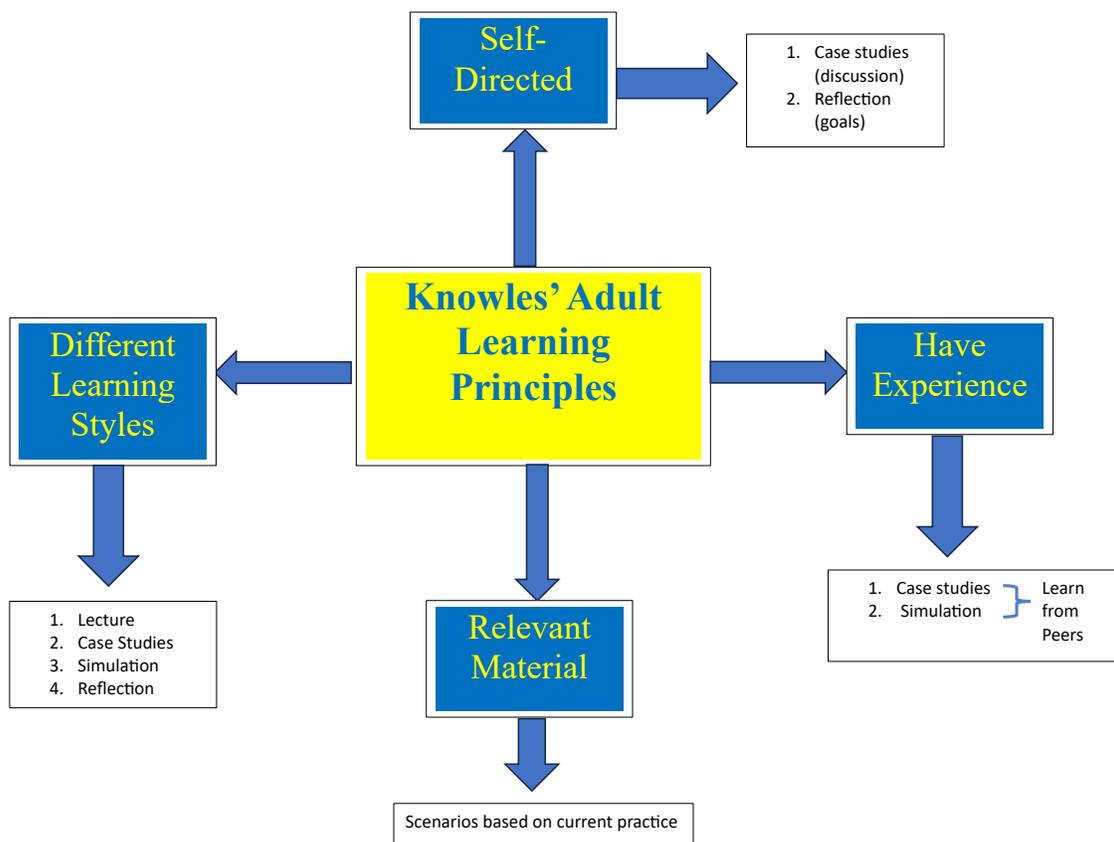
Knowles' Adult Learning Theory

Knowles' adult learning theory contains a set of principles that are applicable to adult learners (Collins, 2004) (see Figure 1). Knowles' adult learning theory can be applied to support DSWs in learning about medication management by recognizing that adults learn best when the material is relevant to their lives and when they can apply what they learn immediately (Knowles, 1978). Therefore, incorporating real-life scenarios based on current practice into the workshop using case studies and simulation allow participants to engage in self-directed discussion, relate to practice, and share experiences, which is beneficial. Furthermore, adult learners often connect prior life experience and knowledge to the learning process, so acknowledging and incorporating their existing knowledge into the training via a pre-test questionnaire can promote engagement and allow participants to determine areas of opportunity. As adult learners are self-directed, providing an opportunity for a reflection exercise with questions related to the simulation experience can allow participants to determine their future learning goals for medication management and develop a plan to meet these goals. Finally, adults appreciate a positive learning environment, so accommodating for different learning styles via

various educational strategies further support the application of Knowles' adult learning theory in medication management training for DSWs.

Figure 1

Diagram of Knowles' Adult Learning Theory



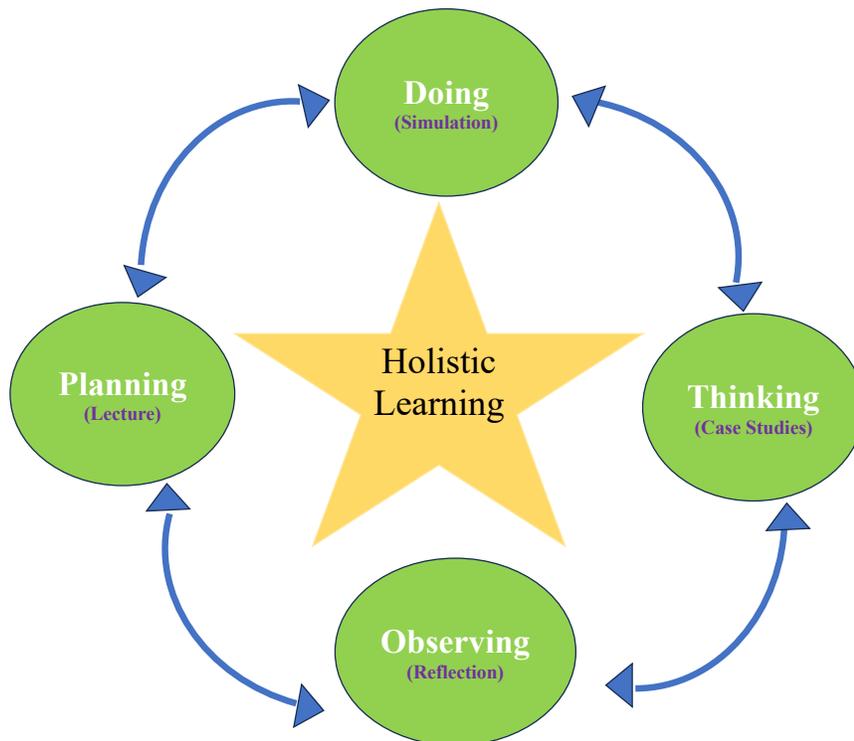
The Kolb's Experiential Learning Theory

The Kolb's (1984) experiential learning theory involves four domains including experience, perception, cognition, and behavior, where learning is viewed as a holistic approach, as opposed to an intellectual or physical approach. According to Sharlanova (2004), this theory involves a cyclical process which involves doing, observing, thinking, and planning (see Figure

2). The doing phase involves actively completing a task either individually or as a group. The observing phase involves reflecting on the task that was completed to determine feelings about the task and what could be done differently. The thinking phase is when the learner tries to make sense of the task that was completed, while the planning phase involves planning to test a theory differently for future. This theory was mainly used to inform the different educational strategies for the medication management workshop such as simulation (doing phase), reflection (observing phase), case studies (thinking phase), and lecture (planning phase). The experiential learning theory guides participants in practicing hands-on skills, but also in the development of learning through reflection and critical thinking.

Figure 2

Diagram of Kolb's Experiential Learning Theory



Instructor Preparation

Before the workshop, the instructor must:

1. Review the resource manual which includes PowerPoint slides (Appendix C). A digital copy of the PowerPoint must be obtained from the training manager.
2. Confirm participant attendance list with training manager
3. Book a training room and ensure equipment is functioning (i.e., computer)
4. Ensure enough chairs for instructor and participants
5. Ensure enough mannequins for simulation exercise
6. Save PowerPoint to jump drive
7. Set up tables, chairs, & mannequin stations
8. Place a copy of PowerPoint slides and agenda at the table for each participant
9. Place the attendance sheet on the table

Print the following:

- Attendance sheet (one copy) (Appendix B)
- PowerPoint slides for each participant (without speaker notes) (max 12 participants) (Appendix C)
- Agenda for each participant (max 12 participants) (Appendix D)
- Icebreaker activity (questions need to be cut and placed in bag) (one copy) (Appendix E)
- Medication management questionnaire (enough for each participant pre and post-

test) (maximum 12 participants) (Appendix F)

- One copy of answers for medication management quiz (instructor only) (Appendix F)
- Case studies (A separate case study for each group) (maximum 4 groups) (Appendix G)
- One copy of answers for case studies (instructor only) (Appendix G)
- Simulation exercises (A separate exercise for each group) (maximum 4 groups) (Appendix H)
- One copy of answers for simulation exercises (instructor only) (Appendix H)
- Blank copies of the medication administration record (instructor will write in the required medications for the simulation exercise) (Appendix I)
- Reflection exercise (enough for each participant) (maximum 12 participants) (Appendix J)
- Workshop evaluation form (enough for each participant) (maximum 12 participants) (Appendix K)

Additional Supplies:

- Pens/pencils
- Blank 8.5 x 11 paper
- Blister packs x 4
- Medication cups

Workshop Content

1. Starting with Introductions/Ice Breaker Activity
2. Completing the Medication Management Pre-Test
3. Discussing the Medication Management Lecture
4. Completing the Case Studies
5. Practicing via Simulation
6. Learning through Reflection
7. Completing the Medication Management Post-Test/Workshop
Evaluation

Starting with Introductions/Ice Breaker Activity

Learning Objectives

By the end of this session, participants will:

1. Understand the purpose of the workshop
2. Feel comfortable communicating and interacting with others in the workshop
3. Be prepared to engage in learning activities

The instructor should:

- Introduce self, title, and the overall goal of the workshop
- Ensure participants sign the attendance sheet
- Review housekeeping items
- Remind participants they each have a copy of the PowerPoint slides and agenda on their table to review and follow along throughout the workshop
- Engage in a discussion with the participants regarding the learning objectives for the workshop
- Allow participants to introduce themselves and complete icebreaker activity (Appendix E)
- For the icebreaker activity, ask each participant to put their hand in the bag (without looking) and pull out a question to answer as part of their introduction.

Completing the Medication Management Pre-Test

Learning Objectives

By the end of this session, participants will:

1. Assess baseline medication management knowledge
2. Recognize their level of medication management knowledge and competence
3. Identify learning priorities for the workshop

The instructor should:

- Distribute a copy of the medication management questionnaire (Appendix F) to all participants
- Allow participants approximately 10 minutes to complete the questionnaire
- Do not provide answers until the post-test

Discussing the Medication Management Lecture

Learning Objectives

By the end of this session, participants will:

1. Identify proper medication management skills (i.e., preparation, storage, administration, and documentation)
2. Discuss medication errors and contributing factors
3. Examine the role of the DSW regarding medication management

The instructor should:

- Provide an overview of the lecture content. The content is covered in approximately 1 hour.
- Review lecture slides in PowerPoint (Appendix C) and answer any questions participants may have
- Take time to model practical skills for medication preparation, administration, and documentation while reading through this portion of the lecture

Completing the Case Studies

Learning Objectives

By the end of this session, participants will:

1. Identify solutions for complex medication management scenarios
2. Apply theoretical knowledge via critical thinking and decision-making
3. Examine alternate ideas and solutions via group discussion and engagement

The instructor should:

- Assign participants into groups of 3 or 4
- Each group should be assigned one case study (Appendix G). Every group will have a different case study.
- Allow each group 15 minutes to read and answer the assigned questions
- After 15 minutes, each group will choose one participant to read their assigned case study, questions, and answers to the class. There will be 3-4 minutes assigned for a participant from each group to present and allow discussion among the class.
- The instructor should review the answers for the case studies (Appendix G) and discuss any points about the case study that the group/class may have missed.

Practicing via Simulation

Learning Objectives

By the end of this session, participants will:

1. Apply theoretical knowledge to practice via hands-on skills
2. Demonstrate practical medication management skills (i.e., medication preparation, administration, documentation)
3. Discuss solutions for complex medication management scenarios

The instructor should:

- Assign participants into groups of 3 or 4
- Each group should be assigned a different simulation exercise (Appendix H)
- The instructor will write the following medications on a medication administration record (Appendix I) and make four copies (one for each group):
0800: Citalopram 10 mg once daily; Fluoxetine 20 mg once daily
1200: Metformin 500 mg twice daily (with lunch and dinner)
1400: Lorazepam 1 mg once daily; Metoprolol 25 mg once daily
1700: Metformin 500 mg twice daily (with lunch and dinner)
- Each group should also be given blank paper to write any required notes
- A blister pack should be provided to each group and medication cups
- Each participant will be responsible for preparing, administering, and documenting at least one medication in their assigned groups

- Each group will work together to solve any issues that arise throughout their assigned simulation exercise
- The instructor will provide guidance and feedback to each group as needed. The instructor should review answers to the simulation exercises (Appendix H) and discuss any points that groups may have missed.

Learning through Reflection

Learning Objectives

By the end of this session, participants will:

1. Consider their learning experience via simulation
2. Identify areas of strength/opportunity in practicing medication management skills
3. Construct a plan for ongoing medication management learning

The instructor should:

- Pass out a copy of the reflection exercise to each participant (Appendix J)
- Remind participants that this is an individual activity and answers do not need to be shared with the class
- Allow participants 10 minutes to quietly complete the reflection exercise

Completing the Medication Management Post-Test/Workshop Evaluation

Learning Objectives

By the end of this session, participants will:

1. Compare their pre and post-test to evaluate knowledge learned
2. Determine level of competence and confidence regarding medication management
3. Discuss workshop experience and provide feedback

The instructor should:

- Pass a copy of the medication management questionnaire (Appendix F) and workshop evaluation to all participants (Appendix K)
- Allow participants approximately 15 minutes to complete the questionnaire and the workshop evaluation
- Once participants have completed the questionnaire, each participant will correct their pre and post-test. The instructor will share answers aloud so they can be corrected as a group (Appendix F)
- Participants should compare their pre and post-test quiz to determine differences in scores
- The instructor will collect all quizzes and written evaluations once complete for feedback purposes
- Remind participants that they will receive a certificate of completion for the workshop via email (Appendix L)

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Appendix A: Notification of Educational Workshop

Notification of Educational Workshop

Dear *(DSW name)*,

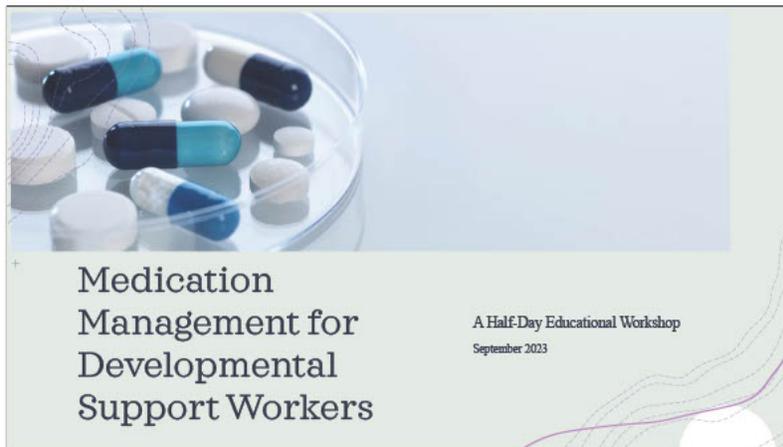
Medication management is an important part of quality care and has been recognized as a training need among this agency. Therefore, we will be offering a mandatory half-day educational workshop titled “Medication Management for Developmental Support Workers” for all DSWs working at Momentum. You have been chosen to attend the first workshop which will be held on *(insert date)* at *(insert location)*. This is a paid workshop and will continue to be offered monthly on a year-round basis, so all DSWs have the opportunity to attend. We are excited for this new training opportunity and look forward to improving client outcomes, as well as DSW competence, knowledge, and work satisfaction. If you have any questions, please do not hesitate to reach out to me.

Sincerely,

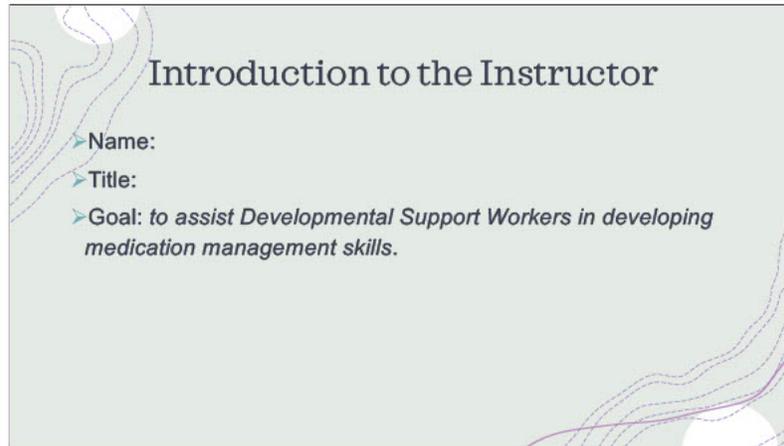
(Training manager signature)

Appendix B: Attendance Sheet

Appendix C: PowerPoint



Introduce myself



Introduction to the Instructor

- Name:
- Title:
- Goal: *to assist Developmental Support Workers in developing medication management skills.*

The instructor should introduce themselves, title, and their goal for the workshop.

Housekeeping Items

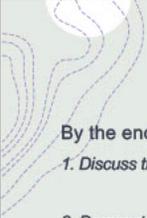
- Washrooms
- Fire Exits
- Cellphones
- Safe and Respectful Learning
- Coffee Break
- Attendance Sheet



Inform participants where the washroom facilities and fire exits are located. Ask participants to turn cellphones on vibrate or silent and to step outside the classroom if a phone call must be taken. Remind participants that this is a safe and respectful place to learn (i.e., raise hand to ask a question, no talking among each other when someone else is speaking, arrive back from break on time). The duration of the workshop is approximately 3.5 hours. Participants must attend the entire workshop to receive a certificate at the end. A 20-minute coffee break with light refreshments will be provided half-way through the workshop, with an additional 10-minute break throughout. Remind participants to sign the attendance sheet.



Each participant has a copy of the agenda to follow.



Learning Objectives

By the end of the workshop, Developmental Support Workers will:

1. *Discuss the importance of proper medication management*
 2. *Demonstrate practical medication management skills*
 3. *Identify the appropriate action(s) to take when a medication management issue is encountered*
- 

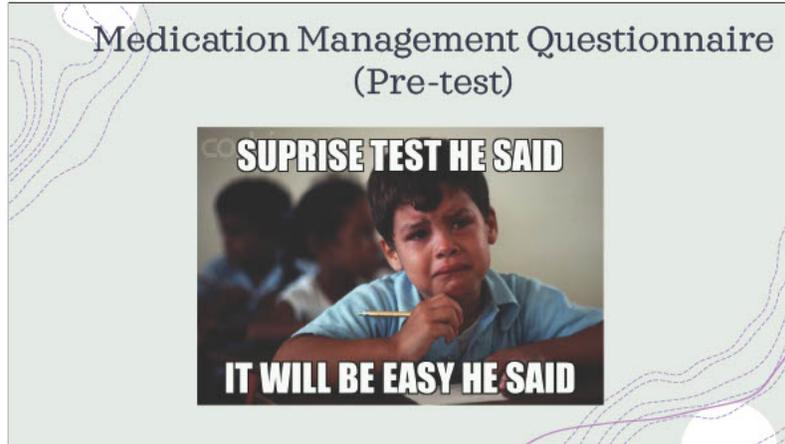
Introduction (Participants)

- Name
- Duration of Time at Momentum
- Icebreaker Activity

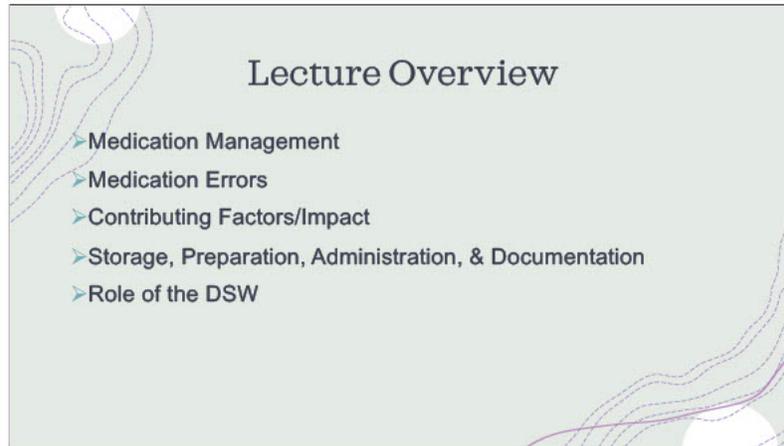


Participants will introduce themselves and tell the group how long they have worked at Momentum. They will also complete the icebreaker activity.

Medication Management Questionnaire (Pre-test)



Remind participants not to panic! This questionnaire is used to test their baseline knowledge and there is no pass or fail score. Students have 10 minutes to complete this quiz. Answers will be corrected after the post-test and compared.



Tell participants the lecture portion of this workshop will cover the following topics.

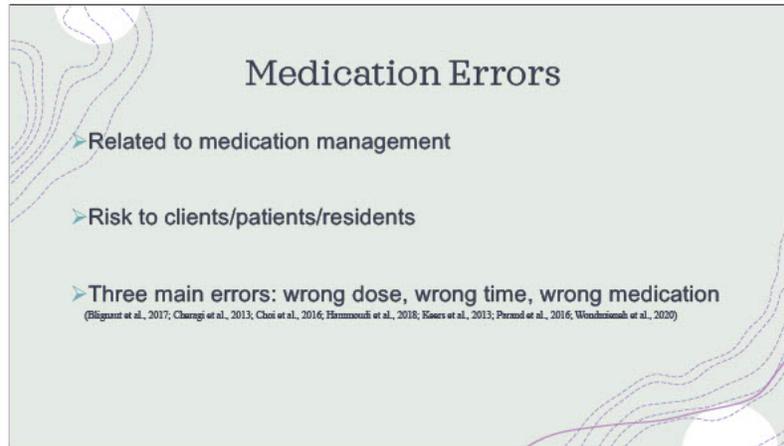


Medication Management

- Client-centered Care
- Various components (i.e., administration, knowledge, skill, critical thinking, decision making)
- Essential for safe, quality care

College of Registered Nurses of Newfoundland and Labrador (CRNNL) (2019)

Medication management is a part of client-centered care. While many people think medication management involves the administration of medication, there are many other components to be considered such as knowledge, skill, critical thinking and decision making. To be competent in medication management, all skills must be integrated. As caregivers, it is important to understand the basis of medication management to practice safely and effectively. Proper medication management leads to safe, quality care for clients (CRNNL, 2019).

A presentation slide with a light green background and abstract white and purple wavy lines on the left and right sides. The title "Medication Errors" is centered at the top. Below it are three bullet points, each preceded by a right-pointing arrowhead. The third bullet point includes a list of references in small text below it.

Medication Errors

- Related to medication management
- Risk to clients/patients/residents
- Three main errors: wrong dose, wrong time, wrong medication
(Biggart et al., 2017; Charngi et al., 2013; Choi et al., 2016; Hammouchi et al., 2018; Kears et al., 2013; Perrod et al., 2016; Wondimuab et al., 2020)

Medication errors are often linked to poor medication management skills (Godfrey et al., 2013). According to Assiri et al. (2018), a medication error is a preventable event that results when medications are not managed properly, which may lead to inappropriate medication use or patient harm. In Canada, approximately 7531 medication incidents were reported from 2015-2020 among long-term care, hospitals, community pharmacy, and home/community care (The Institute for Safe Medication Practices [ISMP], 2020). Based on the literature, the most commonly reported medication errors are wrong dose, wrong time, and wrong medication.

Contributing Factors (Medication Errors)

- Organizational Factors
 1. *Workload*
 2. *Interruptions*
 3. *Lack of clear policies/guidelines*
- Individual Factors
 1. *Lack of knowledge/training ***
 2. *Unclear communication*
 3. *Caregiver burnout/fatigue*



(Ali et al., 2021; Bengtson et al., 2021; Castaldo, 2022; Diomini & Di Simona, 2022; Hamrouzi et al., 2018; Wondmianah et al., 2020; Yousef et al., 2021)

These are some of the most common organizational and individual factors that contribute to medication errors. **One of the most common factors for unlicensed caregivers (i.e., Developmental Support Workers) is lack of knowledge and training (Godfrey et al., 2013). There are many inconsistencies in medication management training offered to unlicensed vs licensed caregivers. As a result, this can lead to increased medication errors throughout community care environments (Berland & Bentsen, 2017).

Impact of Medication Errors

➤ Clients

1. *Adverse Drug Events*
2. *Length of Stay*

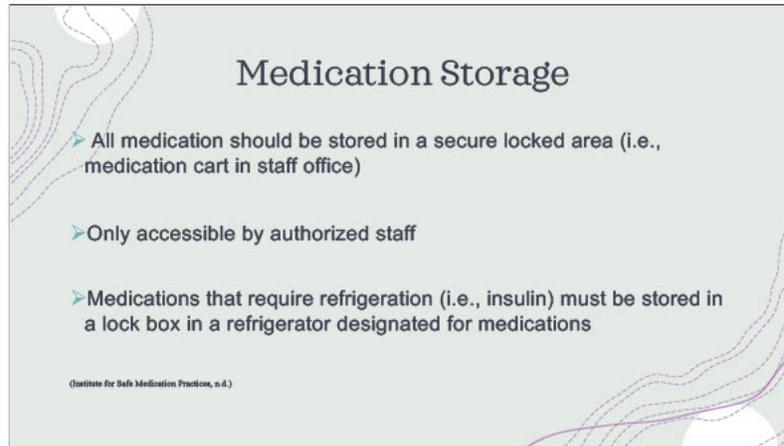
➤ Healthcare Costs

➤ Caregivers

1. *Mental Health*
2. *Self-Confidence*



Clients, the healthcare system, and caregivers are all impacted of medication errors. A preventable ADE is a drug event that is caused by medication errors such as omission, incorrect dose, time, or medication. This may include an allergic reaction, fluctuations in blood sugar or blood pressure, anemia, rash, kidney damage, etc., (Wolfe et al., 2018). As a result, this often leads to hospitalization and an increased length of hospital stay and healthcare costs associated with the length of stay and treatment (Moore et al., 2022). Although clients are often the main priority when a medication error has occurred, caregivers may also feel the impact of these errors for an extended period of time. Consequently, this has a negative impact on caregiver mental health and self-confidence (Athanasakis, 2019; Melnyk et al., 2018).

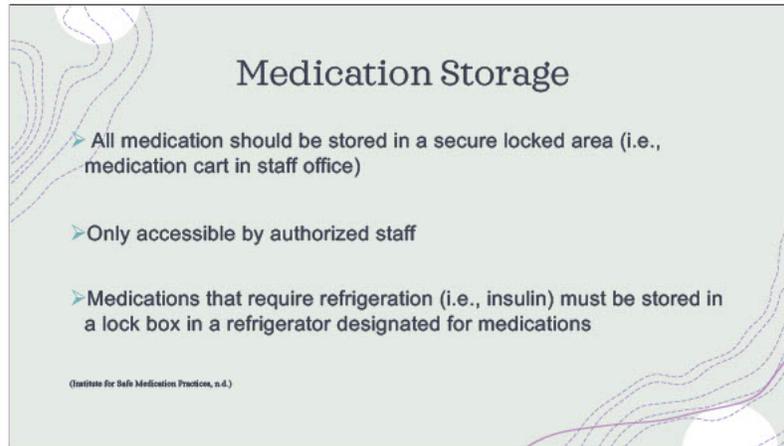
A presentation slide titled "Medication Storage" with a light green background and decorative wavy lines in the corners. It contains three bullet points and a small citation at the bottom left.

Medication Storage

- All medication should be stored in a secure locked area (i.e., medication cart in staff office)
- Only accessible by authorized staff
- Medications that require refrigeration (i.e., insulin) must be stored in a lock box in a refrigerator designated for medications

(Institute for Safe Medication Practices, n.d.)

Medications for clients are typically delivered by the pharmacy or picked up by DSWs. Once medications are received from the pharmacy, they should be checked for accuracy by two employees and then stored in the secure location. To avoid confusion, only current medication should be stored in the medication storage area. Any medications that are discontinued or expired, must be returned to the pharmacy for proper disposal. If a refrigerator for medications is used, daily temperature checks must be completed and documented to ensure the temperature is between 2°C- 8°C (Momentum Developmental Support, 2017).



Medication Storage

- All medication should be stored in a secure locked area (i.e., medication cart in staff office)
- Only accessible by authorized staff
- Medications that require refrigeration (i.e., insulin) must be stored in a lock box in a refrigerator designated for medications

(Institute for Safe Medication Practices, n.d.)

Medications for clients are typically delivered by the pharmacy or picked up by DSWs. Once medications are received from the pharmacy, they should be checked for accuracy by two employees and then stored in the secure location. To avoid confusion, only current medication should be stored in the medication storage area. Any medications that are discontinued or expired, must be returned to the pharmacy for proper disposal. If a refrigerator for medications is used, daily temperature checks must be completed and documented to ensure the temperature is between 2°C- 8°C (Momentum Developmental Support, 2017).

Medication Preparation (PacMed)



PacMed bags have a perforated line so they can be opened easily and poured into a medication cup.

Medication Preparation (Blister Pack)



Blister Packs have a perforated line so they can be separated from the rest of the pack. Once the correct blister is chosen, the label easily peels back to pour into a medication cup.

Medication Preparation

➤ Three checks must be completed for medication preparation:

Check #1: Before preparing the medication

Check #2: While preparing the medication

Check #3: After preparation is completed and before administration

(College of Licensed Practical Nurses of Alberta [CLPNA], n.d.)

The first check is completed before the medication is removed from the packaging. The DSW will compare the medication administration record to the blister pack or PacMed to identify the correct medication to tear from the PacMed or blister pack. The second check is completed while preparing the medication. The DSW will compare the detached PacMed or blister pack to the medication administration record before opening the pack to pour. Once accuracy has been confirmed, the medication can be poured into a medication cup. The final check is completed after all medication has been poured. The DSW will check the blister pack or PacMed before discarding the packaging to ensure accuracy with the medication administration record. Once the final check is complete and accuracy has been confirmed, the DSW can begin administration. * High alert medication (i.e., insulin) and controlled substances (i.e., narcotics) must be checked by two DSWs.

Medication Administration

➤ Before administering medication, ensure the 8 rights of medication administration have been considered

1. Right Patient
2. Right Medication
3. Right Dose
4. Right Route
5. Right Time
6. Right Reason
7. Right Response
8. Right Documentation

(CLRNA, n.d.)

1. Right Patient- check patient identification
2. Right Medication- ensure correct medication is being administered (3 checks)
3. Right Dose- ensure correct dose of medication is being administered (3 checks)
4. Right Route- is the medication given by mouth, sublingual (under tongue), or injection?
5. Right Time- ensure correct medication is being administered at the correct time (3 checks)
6. Right Reason- Is the medication being administered for the right reason? (i.e., Tylenol for a headache)
7. Right Response- is the client have the intended response for the medication (i.e., decreased pain)
8. Right Documentation- ensure all administered medication is documented on the medication administration record

*Note: demonstration of medication administration should be shown by instructor during these slides.

Medication Administration

- Correctly identify client using two identifiers (photo and name)
- Directly observe the client to ensure medication is taken
- If client is known to hoard medications or spit them out, ask to look inside their mouth

(Momentum Developmental Support, 2017)



All clients must be identified using two identifiers before medication administration. Medication must not be left in the possession of clients. DSWs need to directly observe clients taking medications to document accurately.

Medication Documentation

- Document medication **AFTER** administration
- The medication administration record must be signed using initials under the correct date/time
- Medication errors **MUST** be documented on an incident report

(Menzies Developmental Support, 2017)

DSWs must only sign the medication administration record after administration. If an error is made on the medication administration record, do not use whiteout. Instead draw a single line through the entry and write “mistaken entry” with your initials.

***Note: demonstration of medication documentation should be shown by instructor during these slides.**

Medication Documentation (Medication Administration Record)

OTPs
Opioid Treatment Programs

Medication Administration Record (MAR)

Name: _____ Address: _____ Phone: _____

Medication Administration Record (MAR) for _____, Month: _____, Year: 20____

| Medication | Time | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | |
|---------------------------|------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| Medication, Dosage, Route | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Prescribed By | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Medication, Dosage, Route | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Prescribed By | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Medication, Dosage, Route | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Prescribed By | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Medication, Dosage, Route | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Prescribed By | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Medication, Dosage, Route | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Prescribed By | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Medication, Dosage, Route | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Prescribed By | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Signature | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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Explain how to sign the medication administration record. The medications are listed in the first column, and the time in the second. Find the medication and the time you administered then go across to the date and write your initials in the box (e.g. JB). On the bottom of the medication administration record, write your full signature and your initials once on every record for identification purposes.

Medical Incident Report (Documenting a Medication Error)

F- Medication Error

A- DSW Jenny had just administered client's 1000 medication. When DSW returned to the office to sign the medication administration record, she noticed that she had taken the medication from the wrong blister pack (administered 1700 medication instead).

I- DSW monitored the client and called the pharmacy to notify them of the error. Once DSW ensured client was stable, DSW called home manager to notify them as well.

R: Pharmacy indicated to continue to monitor the client; however, she should not have any side effects. Pharmacy advised to administer 1000 medication, but do not give another dose of 1700 medication. DSW administered 1000 medication and signed medication administration record. Client stable and no medical intervention needed.

All medication errors must be reported using a medical incident report. We use the acronym FAIR to write notes. F= Focus, A= Assessment, I= Intervention, R= Response. Here is an example of how to write a note for a medication error.

Medical Incident Report (Medication Refusal)

F: Medication Refusal

A: DSW attempted to administer client's 1700 medication at 1630. Client refused and said he would take them later.

I: DSW continued to offer 1700 medication at 15-minute intervals until the end of the window period for this medication (1645, 1700, 1715, 1730, 1745, 1800). Client refused all times stating, "that medication makes me feel worse".

R: DSW signed the medication administration record with an "R" and initials and put medication in a Ziplock bag to be disposed at the pharmacy.

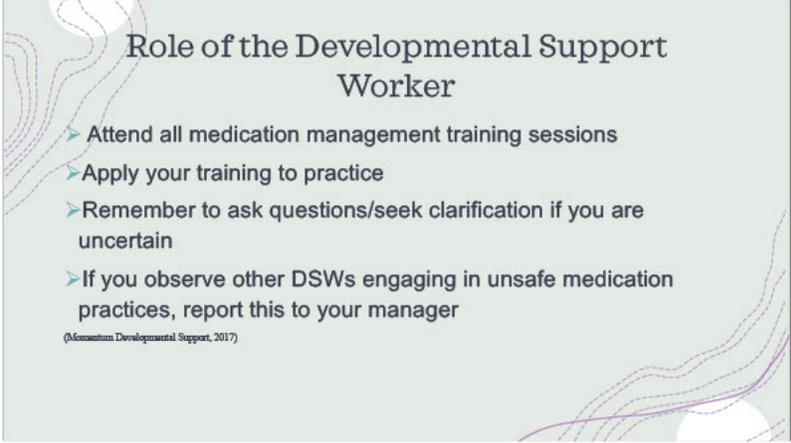
This is an example of how to document a medication refusal on a medical incident report.

What to do if...



- Client refuses medication
- Medication error (i.e., wrong medication, wrong dose, wrong time, missed dose)
- Client is nauseated/vomiting
- Medication missing from blister pack/ PacMed

1. If a client initially refuses medication, staff continue to attempt to administer within the window period for that medication. Once the window period has passed, the DSW will place the medication in a bag and ensure it is returned to the pharmacy. The medication administration record will be marked with an “R” and the DSW initials to indicate that the client refused. A medical incident report must also be completed to provide details of the client refusal.
2. If the DSW makes a medication error, the priority is to monitor the client and determine if medical treatment is needed. The pharmacy should also be contacted for instruction. Once the client is determined to be stable, the DSW will ensure the medication error is documented on a medical incident report, as well as communicated to the manager.
3. If a client is nauseated/vomiting, the DSW should still attempt to administer the medication at the scheduled time. If the client vomits after taking the medication, the DSW should call the pharmacy for further instruction. A medical incident report should be completed by the DSW indicating details of the incident
4. If a medication is missing from the blister pack or PacMed bag, the DSW should call the pharmacy for further instruction. A medical incident report should be completed by the DSW indicating details of the incident (Momentum Developmental Support, 2017).



Role of the Developmental Support Worker

- Attend all medication management training sessions
- Apply your training to practice
- Remember to ask questions/seek clarification if you are uncertain
- If you observe other DSWs engaging in unsafe medication practices, report this to your manager

(Momentum Developmental Support, 2017)

As a DSW, it is your responsibility to ensure clients receive prescribed medication safely. Before administering medication, all DSWs must attend in-person training. It is important to ask questions/seek clarification when needed. Remember, that client safety is your top priority and seeking help is a way to prevent medication errors. If you observe your co-workers engaging in medication practices that were not covered in this training session, please reach out to your manager !

Coffee Break (20 minutes)



Case Studies



Participants should divide themselves into groups of 3 or 4. Each group should be handed a copy of a case study. Participants will be given approximately 15 minutes to read the case study and answer the questions. After 15 minutes, one participant from each group will read their case study and share their answers. Other participants can join in the discussion as well. See answer key for case studies to determine discussion points that should be covered.

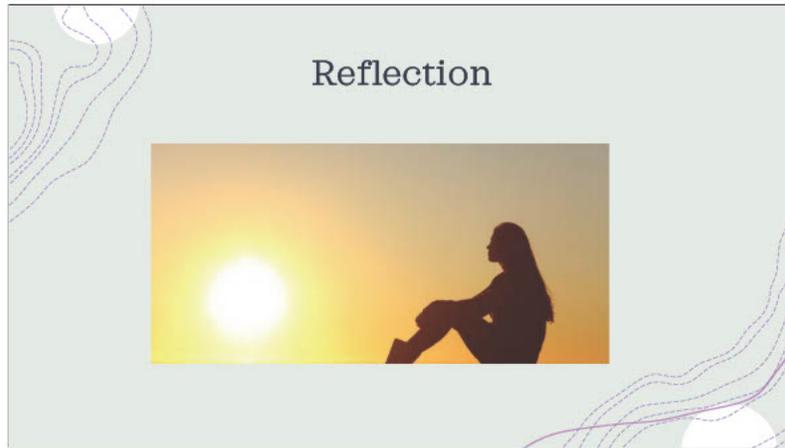
Break (10 Minutes)



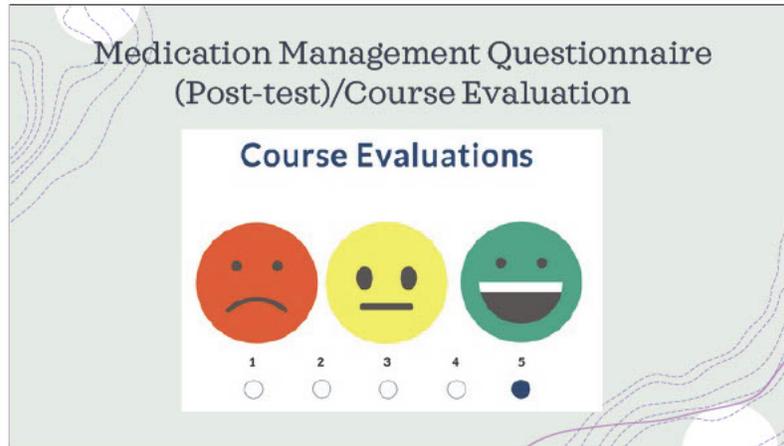
Simulation



Participants should divide themselves into groups of 3 or 4. Each group should be handed a copy of a simulation exercise. Ask each group to read the instructions and begin. The instructor will walk around the room to monitor and provide guidance when necessary. See answer key for simulation problems to ensure groups are meeting required points to solve their problems.



Hand out a copy of the reflection exercise to participants and give them 10 minutes to complete independently.



Again, Remind participants not to panic! Hand out a questionnaire to all participants. This questionnaire is used to test how much they have learned from the workshop by comparing their pre and post test scores. There is no pass or fail score. After 15 minutes, the instructor will read answers aloud and participants will correct their own quiz. The instructor should also hand out a course evaluation form to all participants and ask them to complete. At the end of the workshop, participants can put their feedback form on the instructor desk face down to ensure anonymity. The instructor will collect pre and post test from all participants to review.



Thank participants for attending the workshop. Tell participants they will receive a certificate of completion via email in approximately 24 hours.

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Appendix D: Agenda

Appendix E: Ice Breaker Activity

Ice Breaker Activity Questions

**If you could only eat one food for the rest of your life,
what would it be?**

What is the best superpower?

What is a weird fact you know?

What is your favorite holiday?

**What is the best piece of advice you have ever gotten
at work?**

What was your first job?

Which beverage goes best with pizza?

If you could try any food, what would it be?

What bucket list item do you want to check off next?

What movie made you laugh hard?

What was your best class in school?

Are you more productive in the morning or at night?

Appendix F: Medication Management Questionnaire (Pre-test & Post-test)

Medication Management Questionnaire

Name: _____

Directions: Please read the questions carefully and circle your answer.

1. What steps can the DSW take to prevent a medication error? (select all that apply)

- a. Complete three checks before administering medication
- b. Prepare medication in a room that is dimly light with distractions present
- c. Identify the client using two identifiers
- d. Sign the medication record before administering
- e. Prepare medication for one client at a time

2. An adverse drug event (ADE) is one of the impacts of medication errors on clients?

- a. True
- b. False

3. What temperature should medications that require refrigeration be stored at?

- a. 2°- 8° C
- b. 0°- 5° C
- c. 3°- 9° C
- d. 1°- 6° C

4. When should the DSW check medications during medication preparation? (select all that apply)

- a. Before pouring
- b. After administering
- c. While pouring
- d. The DSW does not need to check medications at anytime

e. After pouring (before administering)

5. Which of the following are considered part of the eight rights of medication administration (select all that apply)?

a. Right dose

b. Right response

c. Right knowledge

d. Right reason

e. Right client

6. When there is more than one client in a residence, the DSW should always prepare medications for both clients at the same time.

a. True

b. False

7. The medication administration record should always be signed before administering the medication.

a. True

b. False

8. All medication errors must be reported, regardless of the outcome.

a. True

b. False

9. When a medication error is made, what is the priority?

a. Document the error

b. Examine the client and determine if medical attention is required

c. Call the manager

d. Nothing, making a medication error is not a big deal

10. If a client refuses medication, what should the DSW do with the medication?

a. Flush it down the sink or toilet

b. Put it in a Ziploc bag and bring it to the pharmacy for disposal

c. Put it back in the secure location and administer it next time

d. Throw it in the garbage

Medication Management Questionnaire- Answer Key

1. A, C, E
2. A
3. A
4. A, C, E
5. A, B, D, E
6. B
7. B
8. A
9. B
10. B

Appendix G: Case Studies

Medication Documentation

Jane is a new DSW who is working her first night shift at a local residence with two clients. Jane is shadowing another DSW, Annie, for her first shift. Jane has completed her required medication management training but has not had the opportunity to administer medication yet. Annie tells Jane that she will give prepare and administer the clients' medication tonight but advises Jane that she can go ahead and sign the medication administration record.

1. Should Jane sign the medication administration record? Why or why not?
2. When should the medication administration record be signed (before or after medication administration)? Why?

Medication Preparation & Administration

Jack is the only DSW on shift at a local residence with two clients today. At 1000, he begins medication preparation for his clients. To save time, he decides to prepare medications for both clients at the same time. Once the medications are prepared, Jack signs the medication record for both clients before administering so he won't forget. Jack is a new casual DSW and has not worked at this home before. The outgoing DSW introduced him to the clients, but now he can't remember who client KW is and who client TT is. Jack thinks that KW had blonde hair, while TT had black hair. He assumes he is correct and administers their medication.

1. Did Jack follow protocol for preparing, administering, and documenting medication?
Why or why not?
2. When Jack assumed the identity of KS and JJ, was he at risk of making a medication error? What should he have done to ensure correctly identify each client?

Rights of Medication Administration

Daisy is a DSW on shift today at a local residence with one client. This client was prescribed amoxicillin 500 mg twice daily last evening for suspected pneumonia. Daisy is supposed to administer the first tablet at 1000 this morning. The client has not taken amoxicillin before, so Daisy knows she must closely monitor the client.

1. Which of the eight medication rights is Daisy adhering too?
2. If the client develops a reaction (i.e., hives, swelling), what should daisy do first?

Medication Administration (The Challenging Client)

Luke is the DSW on shift at a local residence with one client. Since Luke is new to this residence, he reads the client information before starting his shift. He reads a note in her chart that states “client will hoard medications in her mouth or elsewhere (if given the opportunity). At 1000, Luke prepares the client’s medication and goes to the living room to administer to the client. The client states “I’m not ready to take my medication yet, just leave it on the table for me”.

1. Should Luke leave her medication on the table without monitoring? Why or why not?
2. If this client is known to hoard medication in her mouth, what should Luke do following medication administration?

Case Study Discussion Points- Answer Key

Medication Documentation

- Jane should not sign the medication administration record
- She did not administer the medication, so she should not sign a legal document indicating that she did
- The medication administration record must be signed after medication administration. This indicates that the medication was actually administered. The client may refuse, vomit, etc., and in this case the medication administration record would need to be signed differently.

Medication Preparation & Administration

- Jack did not follow protocol for preparing, administering, and documenting medication. He prepared medication for more than one client at a time, he signed the medication record before administering and did not seek appropriate identification.
- Jack was at risk of making a medication error when he assumed the identify of both clients. He should have looked at their pictures on their chart and asked them their name.

Rights of Medication Administration

- Daisy is adhering to the “right response” medication right
- If the client develops a reaction, daisy’s first priority should be to monitor the client and determine if medical treatment is needed

Medication Administration (The Challenging Client)

- Luke should not leave the medication on the table without monitoring, as this client is known to hoard medication and DSWs are responsible for all medication administered.

As per policy, DSWs must see the client take the medication so he can sign the medication administration record.

- Luke should ask the client to open her mouth after administering to ensure she did not hide the medication in her cheeks or under her tongue.

Appendix H: Simulation

Vomiting After Medication Administration

The aim of this scenario is to allow Development Support Workers to practice the essential medication checks required to ensure safe and accurate administration to residents in the Momentum care facility. In this simulation scenario, you are a Development Support Worker (DSW) responsible for administering medication to a client in a Momentum residence. You are required to perform three vital medication checks before administering any medication to ensure the resident's safety and well-being.

In your group, determine who will be DSW #1, DSW #2, DSW #3, and DSW #4 (if required). Each DSW is assigned a medication time below. DSW's will be required to read the medication administration record to determine which medications they are responsible for administering and follow the scenario steps listed. Before you begin, please read the case study as a group to get some background information about your client. Once each DSW has administered their required medications, work together as a group to solve the medication management problem described below. Note: If you need to document additional notes, please use the blank paper provided.

Scenario Steps:

Step 1: Check medication order

- You receive a medication administration task from your supervisor.
- You are given access to the medication cart, a medication administration record (MAR), and the prescribed medication for the resident.

Step 2: Prepare medication for administration

- Begin by gathering the necessary supplies, including the medication, a medication cup, a glass of water, and gloves.
- Ensure that you have identified the correct resident using two patient identifiers, such as their name and date of birth.

- Examine the medication label to verify that it matches the MAR. Three checks must be completed (before pouring, while pouring, after pouring).
- Confirm the resident's name and date of birth on the MAR match the details on the medication label.
- Ensure that the medication is in the correct form (e.g., tablet, liquid) as prescribed.
- Review the medication's purpose, dosage, and any special instructions on the MAR.
- Cross-reference this information with what is written on the medication label.
- Confirm that you understand the medication's purpose and potential side effects.
- Reconfirm the resident's identity by asking them their name and checking their wristband or identification.
- Ensure that the resident is aware of the medication they are about to receive.
- Ask the resident about any known allergies or previous adverse reactions to medications

Step 3: Administer the Medication

- If all checks are successful and there are no concerns, proceed to administer the medication according to the prescribed method (e.g., with food, without food).

Step 4: Document & Follow-Up:

- Document the administration on the MAR, including the date, time, and your initials.
- Store the medication securely and return any unused medication to the designated storage area.
- Ensure the resident is comfortable and address any immediate questions or concerns.

Case Scenario

Jane Doe is a 35-year-old female with an intellectual disability and major depression. She has been living in a local residence provided by Momentum for approximately 2.5 years. She requires one DSW 24/7 to meet her needs. Her medications times are:

0800 – assigned to DSW #1

1200- assigned to DSW #2

1400- assigned to DSW #3

1700- assigned to DSW #4

Problem: After administering Jane Doe's 0800 medication, she vomits immediately and tells the DSW she is not feeling well today. What would you do in this situation?

Refusing Medication

The aim of this scenario is to allow Development Support Workers to practice the essential medication checks required to ensure safe and accurate administration to residents in the Momentum care facility. In this simulation scenario, you are a Development Support Worker (DSW) responsible for administering medication to a client in a Momentum residence. You are required to perform three vital medication checks before administering any medication to ensure the resident's safety and well-being.

In your group, determine who will be DSW #1, DSW #2, DSW #3, and DSW #4 (if required). Each DSW is assigned a medication time below. DSW's will be required to read the medication administration record to determine which medications they are responsible for administering and follow the scenario steps listed. Before you begin, please read the case study as a group to get some background information about your client. Once each DSW has administered their required medications, work together as a group to solve the medication management problem described below. Note: If you need to document additional notes, please use the blank paper provided.

Scenario Steps:

Step 1: Check medication order

- You receive a medication administration task from your supervisor.
- You are given access to the medication cart, a medication administration record (MAR), and the prescribed medication for the resident.

Step 2: Prepare medication for administration

- Begin by gathering the necessary supplies, including the medication, a medication cup, a glass of water, and gloves.
- Ensure that you have identified the correct resident using two patient identifiers, such as their name and date of birth.
- Examine the medication label to verify that it matches the MAR. Three checks must be completed (before pouring, while pouring, after pouring).

- Confirm the resident's name and date of birth on the MAR match the details on the medication label.
- Ensure that the medication is in the correct form (e.g., tablet, liquid) as prescribed.
- Review the medication's purpose, dosage, and any special instructions on the MAR.
- Cross-reference this information with what is written on the medication label.
- Confirm that you understand the medication's purpose and potential side effects.
- Reconfirm the resident's identity by asking them their name and checking their wristband or identification.
- Ensure that the resident is aware of the medication they are about to receive.
- Ask the resident about any known allergies or previous adverse reactions to medications.

Step 3: Administer the Medication

- If all checks are successful and there are no concerns, proceed to administer the medication according to the prescribed method (e.g., with food, without food).

Step 4: Document & Follow-Up:

- Document the administration on the MAR, including the date, time, and your initials.
- Store the medication securely and return any unused medication to the designated storage area.
- Ensure the resident is comfortable and address any immediate questions or concerns.

Case Scenario

John Doe is a 65-year-old male who has been living in a residence provided by Momentum for 4 years. He is diagnosed with an intellectual disability, anxiety, and schizophrenia. His medication times are:

0800 – assigned to DSW #1

1200- assigned to DSW #2

1400- assigned to DSW #3

1700- assigned to DSW #4

Problem: When John Doe is approached with his 1700 medication, he tells the DSW he is not taking it because it makes the voices in his head worse. What should the DSW do?

Medication Error

The aim of this scenario is to allow Development Support Workers to practice the essential medication checks required to ensure safe and accurate administration to residents in the Momentum care facility. In this simulation scenario, you are a Development Support Worker (DSW) responsible for administering medication to a client in a Momentum residence. You are required to perform three vital medication checks before administering any medication to ensure the resident's safety and well-being.

In your group, determine who will be DSW #1, DSW #2, DSW #3, and DSW #4 (if required). Each DSW is assigned a medication time below. DSW's will be required to read the medication administration record to determine which medications they are responsible for administering and follow the scenario steps listed. Before you begin, please read the case study as a group to get some background information about your client. Once each DSW has administered their required medications, work together as a group to solve the medication management problem described below. Note: If you need to document additional notes, please use the blank paper provided.

Scenario Steps:

Step 1: Check medication order

- You receive a medication administration task from your supervisor.
- You are given access to the medication cart, a medication administration record (MAR), and the prescribed medication for the resident.

Step 2: Prepare medication for administration

- Begin by gathering the necessary supplies, including the medication, a medication cup, a glass of water, and gloves.
- Ensure that you have identified the correct resident using two patient identifiers, such as their name and date of birth.

- Examine the medication label to verify that it matches the MAR. Three checks must be completed (before pouring, while pouring, after pouring).
- Confirm the resident's name and date of birth on the MAR match the details on the medication label.
- Ensure that the medication is in the correct form (e.g., tablet, liquid) as prescribed.
- Review the medication's purpose, dosage, and any special instructions on the MAR.
- Cross-reference this information with what is written on the medication label.
- Confirm that you understand the medication's purpose and potential side effects.
- Reconfirm the resident's identity by asking them their name and checking their wristband or identification.
- Ensure that the resident is aware of the medication they are about to receive.
- Ask the resident about any known allergies or previous adverse reactions to medications.

Step 3: Administer the Medication

- If all checks are successful and there are no concerns, proceed to administer the medication according to the prescribed method (e.g., with food, without food).

Step 4: Document & Follow-Up:

- Document the administration on the MAR, including the date, time, and your initials.
- Store the medication securely and return any unused medication to the designated storage area.
- Ensure the resident is comfortable and address any immediate questions or concerns.

Case Scenario

Suzy is a 40-year-old female who has been living in a residence provided by Momentum for 6 years. She is diagnosed with an autism, anxiety, and depression. Her medication times are:

0800 – assigned to DSW #1

1200- assigned to DSW #2

1400- assigned to DSW #3

1700- assigned to DSW #4

Problem: After administering Suzy's 1400 medication, the DSW notices that they made a mistake and took the wrong blister (1700 medications instead). What should the DSW do?

Missing Medication

The aim of this scenario is to allow Development Support Workers to practice the essential medication checks required to ensure safe and accurate administration to residents in the Momentum care facility. In this simulation scenario, you are a Development Support Worker (DSW) responsible for administering medication to a client in a Momentum residence. You are required to perform three vital medication checks before administering any medication to ensure the resident's safety and well-being.

In your group, determine who will be DSW #1, DSW #2, DSW #3, and DSW #4 (if required). Each DSW is assigned a medication time below. DSW's will be required to read the medication administration record to determine which medications they are responsible for administering and follow the scenario steps listed. Before you begin, please read the case study as a group to get some background information about your client. Once each DSW has administered their required medications, work together as a group to solve the medication management problem described below. Note: If you need to document additional notes, please use the blank paper provided.

Scenario Steps:

Step 1: Check medication order

- You receive a medication administration task from your supervisor.
- You are given access to the medication cart, a medication administration record (MAR), and the prescribed medication for the resident.

Step 2: Prepare medication for administration

- Begin by gathering the necessary supplies, including the medication, a medication cup, a glass of water, and gloves.
- Ensure that you have identified the correct resident using two patient identifiers, such as their name and date of birth.

- Examine the medication label to verify that it matches the MAR. Three checks must be completed (before pouring, while pouring, after pouring).
- Confirm the resident's name and date of birth on the MAR match the details on the medication label.
- Ensure that the medication is in the correct form (e.g., tablet, liquid) as prescribed.
- Review the medication's purpose, dosage, and any special instructions on the MAR.
- Cross-reference this information with what is written on the medication label.
- Confirm that you understand the medication's purpose and potential side effects.
- Reconfirm the resident's identity by asking them their name and checking their wristband or identification.
- Ensure that the resident is aware of the medication they are about to receive.
- Ask the resident about any known allergies or previous adverse reactions to medications.

Step 3: Administer the Medication

- If all checks are successful and there are no concerns, proceed to administer the medication according to the prescribed method (e.g., with food, without food).

Step 4: Document & Follow-Up:

- Document the administration on the MAR, including the date, time, and your initials.
- Store the medication securely and return any unused medication to the designated storage area.
- Ensure the resident is comfortable and address any immediate questions or concerns.

Case Scenario

Bob is a 53-year-old male who has been living in a residence provided by Momentum for 2 years. He is diagnosed with autism, ADHD, and bipolar. His medication times are:

0800 – assigned to DSW #1

1200- assigned to DSW #2

1400- assigned to DSW #3

1700- assigned to DSW #4

Problem: Upon preparing Bob's 1200 medication and completing the three medication checks, the DSW notices that one of the required medications listed on the medication administration record is missing from the blister pack. What should the DSW do?

Simulation Exercises- Group Problem Solving Answers

Vomiting After Medication Administration

For the problem in this simulation, group members should discuss calling the pharmacy for further instruction. DSWs would be required to follow the pharmacy instructions and document details of the incident via a medical incident report.

Refusing Medication

For the problem in this simulation, group members should discuss reattempting to administer the medication to the client within the specified window period. If the client continues to refuse and the window period is ended, DSWs must write an “R” on the medication administration record and their initials and document the refusal on a medical incident report. The medication will be placed in a Ziploc bag and returned to the pharmacy for disposal.

Medication Error

For the problem in this simulation, group members should discuss monitoring the client as the main priority and determine if medical treatment is necessary. DSWs would be required to follow pharmacy instruction. The residence manager should also be informed. Finally, a medical incident report would be completed with details of the medication error.

Missing Medication

For the problem in this simulation, group members should discuss calling the pharmacy for further instruction. DSWs would be required to follow the instructions and document details of the incident on a medical incident report.

Appendix I: Medication Administration Record

MEDICATION ADMINISTRATION RECORD

PAGE ____ OF ____

NAME OF RESIDENT _____

Month/Year: _____

| MEDICATION | TIME | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | | | | | |
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Appendix J: Reflection

Reflection Exercise

Directions: Please take 10 minutes to think about the simulation exercise you just completed and answer the following questions. This is for your personal learning and does not need to be shared with the group or the instructor.

1. How confident do you feel administering medication to clients after completing the simulation exercise?
 - a. Very confident
 - b. Somewhat confident
 - c. Neutral
 - d. Somewhat unconfident
 - e. Very unconfident

1. What did you do well during this simulation exercise?

2. What did you not do well during this simulation exercise?

3. How can you improve your medication management skills?

Appendix K: Workshop Evaluation

Course Evaluation

Medication Management Half-Day Workshop

Course Instructor: _____

Date: _____

Please put a checkmark in the box to indicate your choice.

| | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree |
|--------------------------------------------------------------|-------------------|-------|---------|----------|----------------------|
| The training met my expectations | | | | | |
| The training objectives were clearly identified and followed | | | | | |
| The content was organized and easy to follow | | | | | |
| There was adequate time for discussion and questions | | | | | |
| The materials distributed were pertinent to my learning | | | | | |

| | | | | | |
|----------------------------------------------------------------|--|--|--|--|--|
| The training room was comfortable and conducive to my learning | | | | | |
| The instructor was knowledgeable about the topic | | | | | |
| The instructor communicated effectively | | | | | |
| I had enough time to practice skills | | | | | |
| I will be able to apply this training to practice | | | | | |

What did you enjoy most about this workshop?

What did you enjoy least about this workshop?

How can this workshop be improved?

Appendix L: Certificate

Certificate of Completion

This certificate is awarded to

for the completion of

Medication Management Half-Day Workshop

for Developmental Support Workers

Instructor Signature

Date