

Original Research

Exploring the impact of pharmacist involvement in palliative care medication management

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Abstract

This study aimed to evaluate the impact of pharmacist involvement in palliative care medication management. By examining medication appropriateness, patient outcomes, and healthcare team collaboration, to identify opportunities for improvement. Data was collected from 50 palliative care patients at King Hussein Medical City in Jordan. Results revealed that pharmacist interventions positively influenced medication safety and efficacy, but their involvement was inconsistent. Barriers to effective collaboration included communication challenges, time constraints, and limited pharmacist availability. The study underscores the need for increased pharmacist training and expanded roles within palliative care teams to optimize medication management and improve patient outcomes. Therefore, the study recommended the necessity of improving communication within the healthcare team Enhancing pharmacist participation, strengthening medication reconciliation, and improving patient education.

Keywords: pharmacist, palliative care, medication management, patient outcomes, healthcare collaboration

INTRODUCTION

Pharmacists have a prominent role in drug therapy and experience in understanding and managing it, as they are key members of the multidisciplinary palliative care team. Their participation in the management of palliative care medications includes a set of responsibilities, the most important of which are medication review, improvement, and reconciliation, in

addition to providing education and support to patients and caregivers. They also play a vital role in ensuring drug safety, reducing harmful effects, and improving treatment outcomes for patients receiving palliative care (Johnson, 2023). The concept of palliative care as a specialized approach in health care has an important role in improving the quality of life for patients, especially those who suffer from serious diseases, which requires attention to different systems of aspects of health care, both known and modern, which makes this approach a priority for symptom management and support. Psychosocial and comprehensive care, especially for patients facing chronic, life-limiting conditions. Among the many challenges facing the provision of effective palliative care is the complex nature of medication administration, which plays a crucial role in alleviating symptoms and enhancing patient comfort. In this context, many studies and experiences have highlighted the significant impact of pharmacist involvement in palliative care settings.

These studies have shown improvements in symptom management, medication adherence and overall patient satisfaction when pharmacists are actively involved within the care team. Additionally, pharmacist-led interventions have been shown to reduce medication-related complications, hospitalizations, and healthcare costs, ultimately contributing to In improving patient outcomes and quality of life. (Smith, 2022). Where a study revealed (Smith 2022& Johnson ,2023) The results a significant improvement in communication (SMD = 0.52) as a result of the pharmacist's interventions and the role of the importance of the pharmacist's participation in enhancing collaborative care for palliative patients and providing a comprehensive evaluation of the impact of pharmacists' interventions in improving communication and cooperation within palliative care teams and in-depth statistical analysis. The study reached a comprehensive overview of the

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potential benefits that pharmacist intervention may achieve in this context and the extent to which cooperation is achieved between members of healthcare teams and the provision of integrated care. As the study revealed (Fernandes, et al ,2021) study revealed that pharmacist involvement in palliative care can reduce healthcare costs. where the effect of pharmacy interventions on health care costs was examined in Palliative care including a total of 1,645 patients receiving palliative care for various conditions. Pharmacist interventions in these studies included activities such as medication reconciliation, medication reviews, patient education, and collaboration with other healthcare providers on medication management plans. The meta-analysis concluded that pharmacist interventions led to a statistically significant reduction in healthcare costs associated with palliative care.

The pooled mean difference was -\$1,022.26 (95% CI: -\$1,916.27 to -\$112.85), indicating a potential cost-saving benefit from pharmacist involvement that resulted in reduced healthcare costs in palliative care and reduced errors. Pharmacokinetics and Adverse Drug Events For pharmacists, improving medication regimens for symptom control, may reduce the need for additional medications or procedures. Ideal palliative care is achieved by following a multidisciplinary approach, which is an effective systems approach, which is important to ensure comprehensive, patient-centred care because it addresses not only the physical symptoms, but also the psychological, social, and spiritual aspects of the patient's well-being. Palliative care management is also important. It represents a professional collaboration between pharmacists, doctors, nurses, social workers and other health professionals to develop personal care plans specifically designed to meet the needs of all patients and in light of the use of a set of tasks and tools, including electronic health records (EHRs) and integrated pharmacy management systems, to work to simplify operations. Review, reconcile and monitor medications, creating an atmosphere of cooperation for pharmacists in collaboration with other healthcare providers) Coyne, 2017) .

Despite all this, many challenges hinder the provision of effective palliative care, including insufficient access to specialized palliative care services, the lack of training programs for health service providers, the lack of effective means of communication between the staff, complex treatment systems, major clinical challenges, and the difficulty of managing patients' symptoms. Those suffering from chronic diseases, therefore, to overcome these difficulties, healthcare institutions must focus on workforce development programs to enhance the palliative care skills of pharmacists and other healthcare professionals to achieve quality palliative care services, as well as early care planning programs to ensure that patients receive appropriate and timely care. appropriate and consistent with their goals and values) Morrison& Mitchell, 2016).

In light of these developments that govern the role of the pharmacist, many challenges hinder the effective provision of palliative care, including the inability to access specialized services, the lack of training programs for health care providers, ineffective communication between employees, complex

treatment systems, and major clinical challenges. Difficulties in managing symptoms of chronic diseases require the integration of personalized care plans specifically designed to meet the needs of palliative care patients through the use of tools such as electronic health records (EHRs) and integrated pharmacy management systems. This approach helps in reviewing, reconciling and monitoring medications, which enhances an atmosphere of mutual collaboration between pharmacists and other healthcare providers) Coyne, 2017).

Hence, we find that the problem of the search is to understand the extent of the impact of pharmacist participation in the management of palliative care medications, through the general question: To what extent does pharmacist participation in the management of palliative care medications affect patient outcomes, health care team collaboration, and the overall quality of palliative care services. In light of the increasing spread of chronic diseases and the increasing demand for effective palliative care services because of their crucial role in improving the quality of life for patients facing life-limiting conditions, the importance of research appears in the following points-

1. The quality of palliative care services through the role of the pharmacist in providing comprehensive palliative care services that link patients to their needs.
2. Improving treatment systems to improve patient outcomes by reducing drug side effects and symptoms. This reflects the pharmacist's participation in improving patient outcomes and improving quality of life (Mitchell, 2016)
3. The role of the health care team By defining the role of the pharmacist in bridging communication gaps between health care providers to activate the role of care to reduce errors and reduce opportunities for this in the medication process (Ferrario & Rocco, 2018).
4. The participation of pharmacists in palliative care also represents the greatest place in enhancing medication management, which requires providing a comprehensive approach to patient care, and addressing clinical, social, and spiritual needs, by improving the integration of pharmacy services and diversifying all plans to suit this role and within the limits of full familiarity with the role of palliative care. To achieve maximum benefits (Sally & Sarah ,2021).

From the above This research objectives: to explore the impact of pharmacist participation in the management of palliative care, bridge the gap between intended medication processes and real-world practices, to work to enhance patient safety and ensure the proper use of palliative medications.

Medication appropriateness

Refers to evaluating the validity and appropriateness of medications used in patient care. This assessment includes analyzing whether prescribed medications are appropriate and effective for each patient's condition, including checking compatibility with the patient's health condition and other



medications they are taking, providing advice and guidance for improvement where necessary ensuring that all team members are informed of patients' needs and treatment plans) Bates, et al. 2018, Jaber, et al 2024).

Improving patient outcomes

It is a critical goal in healthcare to assess patient satisfaction and analyze their experiences. By doing so, areas that need improvement can be identified. Meanwhile, patient experience measurement programs provide tools for collecting and analyzing data, which helps improve processes and communication between patients and care teams, with a focus on quality and satisfaction. Through this, we can achieve a better patient experience and improve healthcare overall. Impact through the influence of pharmacist participation on medication adherence and symptom management among palliative care patients? Focus on drug-related adverse events (AEs) in palliative care patients? It also enhances communication and collaboration between healthcare team members in palliative care settings. To what extent does this reflect on overall satisfaction and quality of palliative care services for patients and their families? (Wang, & Huddle, 2020)

Material and Roads

Palliative care and pharmacist intervention represent an interactive relationship in light of modern science and what it requires to shed light on the most important methods and modern tools to understand this phenomenon by linking the roles to better understand the concept of pharmacist intervention in medication management in palliative care and apply it more effectively.

- A. Activating smart applications that contribute to pharmacists with advice in providing pharmaceutical care in understanding palliative care, managing dosing directions, administering medications, and tracking symptoms and drug interactions.
- B. Store and share medical information between pharmacists and patients in the context of palliative care, facilitating care coordination and the provision of integrated health care. (Smith, et al. 2021).
- C. Using technology to provide remote consultation care services, the most important of which are online pharmaceutical consultations and communication with the medical team and patients directly, as well as clinical guidelines, databases about medications, drug interactions, and information about improving the use of medications in this context.
- D. Performing predictive analytics based on large data sets and their relationship to the impact of medication management, using virtual reality technology and augmented reality to provide educational, training, and guidance experiences for pharmacists on how to provide pharmaceutical care in palliative care. (Fernandes, et al, 2021)

METHODS

An approach must be followed that suits the extent of pharmacists' participation in the management of medications for palliative care, as it tends to extrapolate to reach the required data to test it on the study population and analyze it to reach results achieved through the sample population of patients who receive palliative care and who include pharmacy interventions in the management of special medications. them through the following directions, Ethical approvals This study took into account the laws and ethics applicable in health research and its medical fields and sciences, as the standards and approval of the Institutional Review Board (IRB) were taken into account to ensure the protection of the rights and safety of the study participants. The researcher explained the objectives and procedures of the study to the participants and took into account their written consent and knowledge before starting any intervention. Or collect data, taking care to deal with all personal information of participants with strict confidentiality and using it to serve the purpose of this research topic.) Williams & Arnold, 2017).

- **Knowledge tools:** In a way that reflects the extent of the impact of pharmacist participation in the management of palliative care medications. and to identify trends or associations between pharmacist interventions and patient outcomes in palliative care settings.
- **Data collection methods:** Accrediting electronic medical records (EMRs) King Hussein Medical City in Jordan will be reviewed to collect data on the following for patients receiving palliative care, including information about medication management systems - prescriptions - the level of pharmaceutical intervention according to the demographic segment of patients and providing the necessary medical information about them from medical history and clinical results.
- **Sample collection and selection method:** By selecting a representative patient sample from King Hussein Medical City in Jordan, this study includes patients who fully meet the age, diagnosis, and pharmaceutical intervention criteria for the sample

RESULTS

Statistical analyzes and results

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp). Qualitative data were described using numbers and percent. Quantitative data were described using range (minimum and maximum), mean, standard deviation, median and interquartile range (IQR) (Figure 1).

Table 1: presents the demographic distribution of the 50 studied cases. The gender distribution shows a slightly higher proportion of female participants, with 29 females accounting for 58% of the total, compared to 21 males, who represent 42%. When considering the age distribution, the majority of the cases fall within the 31 to 50 years age range, encompassing



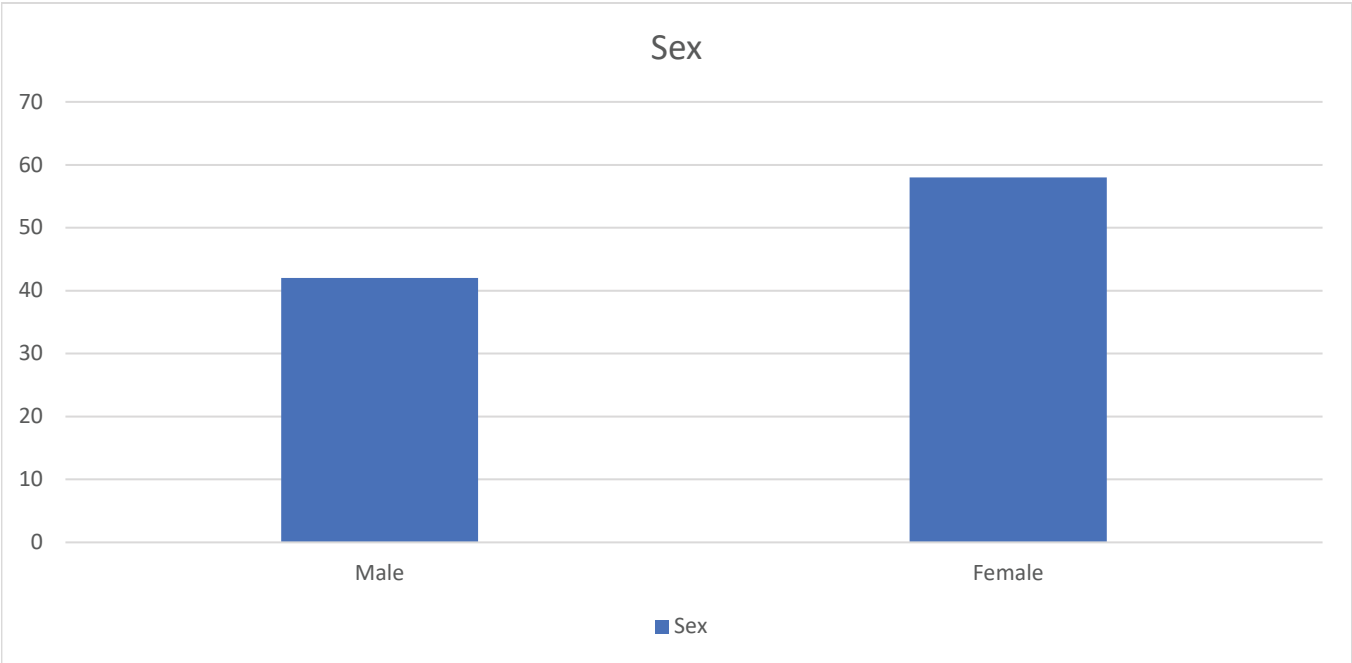


Figure 1. Graph regarding table 1 parameters

Table 1: Distribution of the studied cases according to demographic data		
Demographic data	No.	%
Sex		
Male	21	42
Female	29	58
Age (years)		
From 20 to 30	14	28
From 31 to 50	24	48
From 51 or more	12	24

24 individuals or 48% of the sample. This is followed by the 20 to 30 years age group, which includes 14 participants, making up 28% of the cases. The remaining 12 cases, equivalent to 24%, are aged 51 years or older. These distributions indicate a balanced gender representation with a tendency towards a middle-aged cohort within the sample.

Table 2: categorizes the studied cases based on their diagnosed medical conditions. Lung disease is the most prevalent diagnosis, affecting 14 individuals, which constitutes 28% of the total cases. Kidney and liver diseases each account for 10 cases, representing 20% each. Neurological disorders are present in 6 cases, making up 12% of the sample. Heart disease is diagnosed in 5 cases, accounting for 10%, while HIV/AIDS affects 4 individuals, corresponding to 8%. Cancer is the least common diagnosis, with only 1 case, making up 2% of the total. This distribution highlights a higher incidence of lung, kidney, and liver diseases among the studied cases, with a relatively low occurrence of cancer.

Table 2: Distribution of the studied cases according to diagnosis		
	No.	%
Diagnosis		
Heart disease	5	10
Lung disease	14	28
Kidney disease	10	20
Liver disease	10	20
Neurological disorders	6	12
HIV/AIDS	4	8
Cancer	1	2

Table 3: examines various study variables concerning the interactions between patients and pharmacists. Regarding the frequency of detailed medication reviews conducted by pharmacists, the responses vary: 10% (5 cases) report “Never,” 30% (15 cases) “Scarcely,” 36% (18 cases) “Sometimes,” 14% (7 cases) “Mostly,” and 10% (5 cases) “Always.” In terms of pharmacists providing medication information, 8% (4 cases) state “Never,” 28% (14 cases) “Scarcely,” 32% (16 cases) “Sometimes,” 28% (14 cases) “Mostly,” and only 4% (2 cases) “Always.” When asked about medication adherence as prescribed, 10% (5 cases) say “Never,” 28% (14 cases) “Scarcely,” 36% (18 cases) “Sometimes,” 22% (11 cases) “Mostly,” and 4% (2 cases) “Always.”

Awareness of pharmacists’ roles in palliative care medication management is also assessed: 22% (11 cases) are aware, 58% (29 cases) are not, and 20% (10 cases) are partially aware. Collaboration with pharmacists in managing palliative care medications is reported as “Daily” by 14% (7 cases), “Weekly”

Table 3: Distribution of the studied cases according to study variables

	No.	%
How often has your pharmacist conducted a detailed review of your medications?		
Never	5	10
Scarcely	15	30
Sometimes	18	36
Mostly	7	14
Always	5	10
How often does your pharmacist provide you with information about your medications?		
Never	4	8
Scarcely	14	28
Sometimes	16	32
Mostly	14	28
Always	2	4
How often do you take your medications as prescribed by your health care provider?		
Never	5	10
Scarcely	14	28
Sometimes	18	36
Mostly	11	22
Always	2	4
Are you aware of the role of pharmacists in palliative care medication management?		
Yes	11	22
No	29	58
Partially	10	20
How often do you collaborate with pharmacists in managing palliative care medications?		
Daily	7	14
Weekly	12	24
Monthly	17	34
Rarely	12	24
Never	2	4
In your experience, how has pharmacist involvement impacted the safety and efficacy of medications in palliative care?		
Significantly improved	4	8
Moderately improved	22	44
No change	20	40
Decreased	4	8

by 24% (12 cases), “Monthly” by 34% (17 cases), “Rarely” by 24% (12 cases), and “Never” by 4% (2 cases). The impact of pharmacist involvement on medication safety and efficacy in palliative care is seen as “Significantly improved” by 8% (4 cases), “Moderately improved” by 44% (22 cases), “No change” by 40% (20 cases), and “Decreased” by 8% (4 cases). These results suggest a mixed perception and varying experiences

with pharmacist involvement in medication management.

Table 4: further explores the effectiveness of pharmacist recommendations in palliative care. When asked how often pharmacist recommendations are followed, 6% (3 cases) say “Always,” 24% (12 cases) “Often,” 48% (24 cases) “Sometimes,”

Table 4 : Distribution of the studied cases according to study variables

	No.	%
How often do you follow pharmacist recommendations in palliative care medication management?		
Always	3	6
Often	12	24
Sometimes	24	48
Rarely	11	22
Never	0	0
Have pharmacist recommendations led to optimization of palliative care medications (e.g., reducing adverse effects, improving symptom control)?		
Yes	15	30
No	29	58
Unsure	6	12
Do you believe that pharmacists need additional training to enhance their role in palliative care medication management?		
Yes	18	36
No	16	32
Unsure	16	32
What are the main barriers to effective collaboration between pharmacists and palliative care providers?		
Lack of time	4	8
Communication barriers	14	28
Lack of pharmacist availability	19	38
Other (please specify)	13	26
Overall, how satisfied are you with the current level of pharmacist involvement in palliative care medication management?		
Very satisfied	3	6
Satisfied	7	14
Neutral	24	48
Dissatisfied	14	28
Very dissatisfied	2	4
What improvements would you suggest to enhance pharmacist involvement in palliative care medication management?		
Education and Training	7	14
Expanded Role and Responsibilities pharmacists	19	38
Position pharmacists as medication management specialists - within the palliative care team.	17	34
Improved Communication and Collaboration between pharmacists	7	14

and 22% (11 cases) "Rarely," with no cases reporting "Never." The optimization of palliative care medications due to pharmacist recommendations is acknowledged by 30% (15 cases), while 58% (29 cases) do not observe this, and 12% (6 cases) are unsure.

Opinions on whether pharmacists need additional training for palliative care medication management are split: 36% (18 cases) believe it is necessary, 32% (16 cases) do not, and another 32% (16 cases) are unsure. The main barriers to effective collaboration between pharmacists and palliative care providers include "Lack of time" (8%, 4 cases), "Communication barriers" (28%, 14 cases), "Lack of pharmacist availability" (38%, 19 cases), and "Other" reasons specified by 26% (13 cases).

Overall satisfaction with the current level of pharmacist involvement in palliative care is rated as "Very satisfied" by 6% (3 cases), "Satisfied" by 14% (7 cases), "Neutral" by 48% (24 cases), "Dissatisfied" by 28% (14 cases), and "Very dissatisfied" by 4% (2 cases). Suggested improvements include "Education and Training" (14%, 7 cases), "Expanded Role and Responsibilities" (38%, 19 cases) (Figure 2), positioning pharmacists as medication management specialists within the palliative care team (34%, 17 cases), and "Improved Communication and Collaboration" (14%, 7 cases). These insights highlight a need for enhanced training, expanded roles, and better communication to improve pharmacist involvement in palliative care (Figure 3).

DISCUSSION

This was a study designed to examine the role of a pharmacist in the medication management of patients receiving

palliative care. Specifically, it looked into the effects that pharmacists have on patient outcomes and also determined the barriers that exist to effective collaboration. Results from 50 participants with different diagnoses showed key insights into present practices, perceptions, and areas for improvement of pharmacists' involvement in the delivery of palliative care (Figure 4,5,6).

Demographic data shows a good balance in terms of sex: 42% were males, and 58% were females. Nearly half, 48%, of the respondents were aged 31 to 50 years. Probably this middle-aged cohort will have varied and complex health needs. The diagnoses ranged from the highest, lung disease, at 28%, to kidney and liver diseases, both 20%. These conditions usually involve labor-intensive and multifaceted medication management underlying the essence of pharmacists in ensuring effective treatment regimens (Figure 7).

The pharmacists reviewed the medications in detail at a high frequency: 36% of them indicated this was done "sometimes," and 10% indicated "always." Similarly, 32% of the participants indicated that, in their experience, pharmacists "sometimes" provided information about their medications; 28% said this happened "mostly." These findings suggest room for improvement in the consistency and thoroughness of pharmacist interventions. Moreover, prescribed medications were taken patchily: 36% "sometimes" adhered to their regimen, while another 22% did so "mostly." More than this, only 22% of participants did so with full awareness of the role that pharmacists can play in the management of palliative care medication, indicating a major lacuna in patient education and awareness (Figure 8).

It also investigated the frequency of contacts by pharmacists

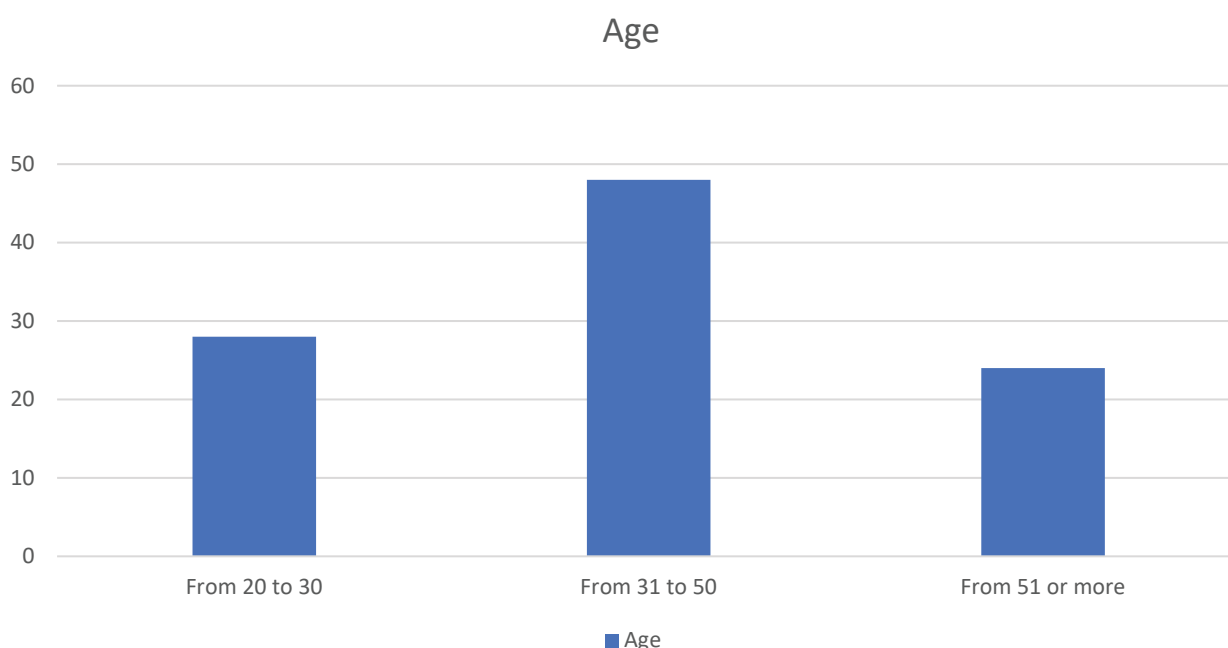


Figure 2. Graph regarding table 1 parameters



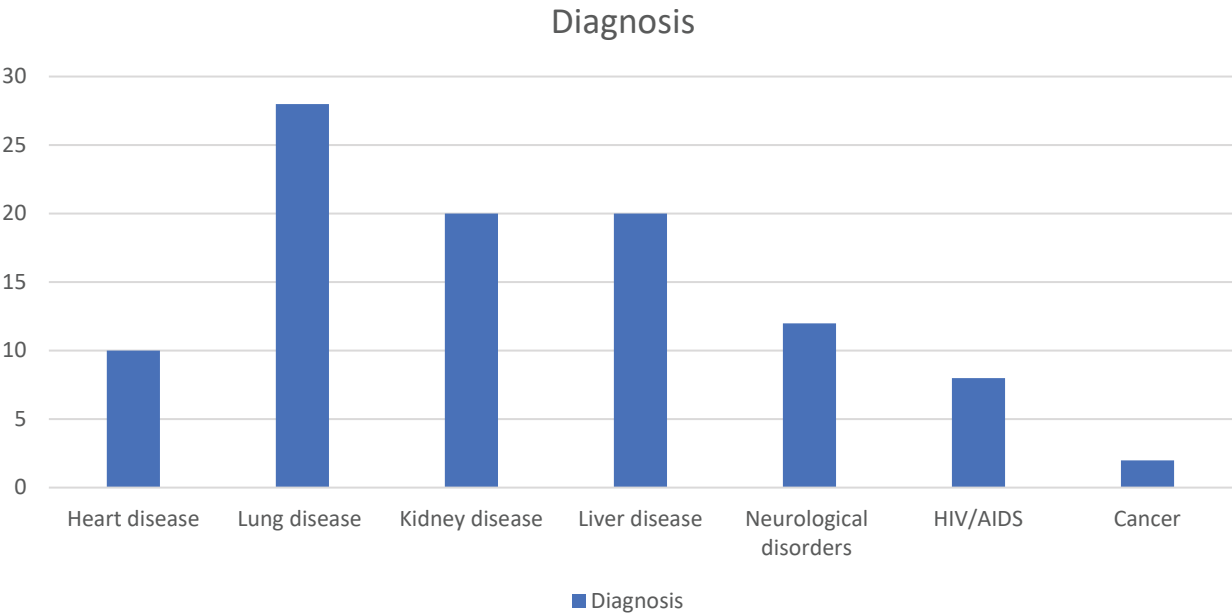


Figure 3. Graph regarding table 2 parameters

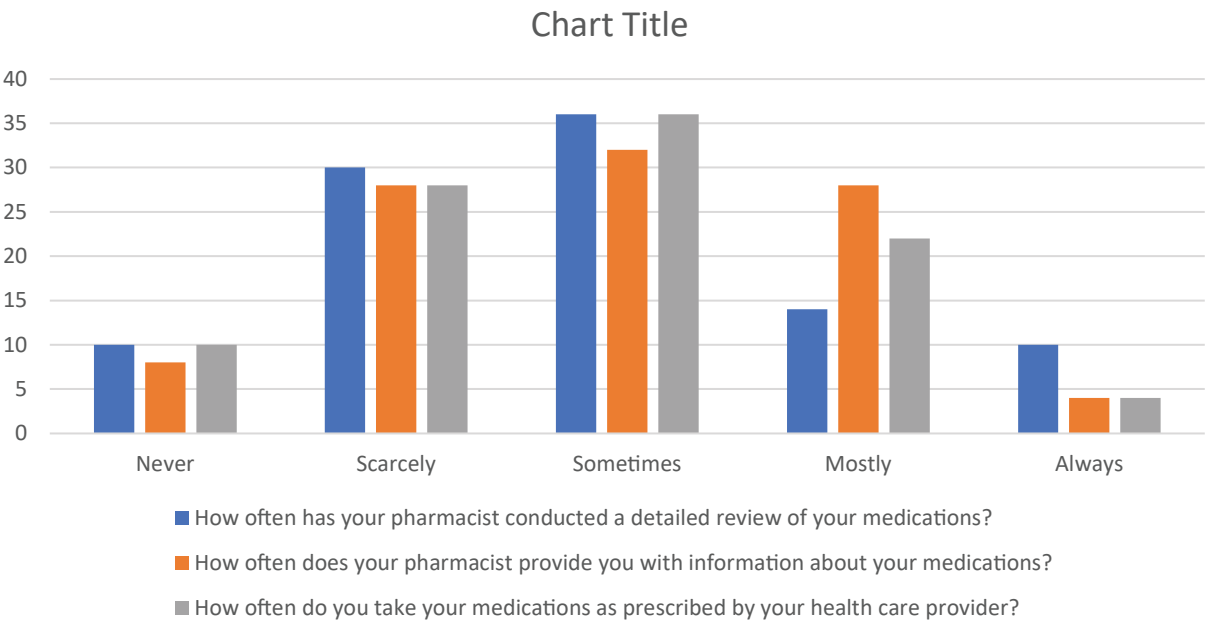


Figure 4. Graph regarding table 3 parameters

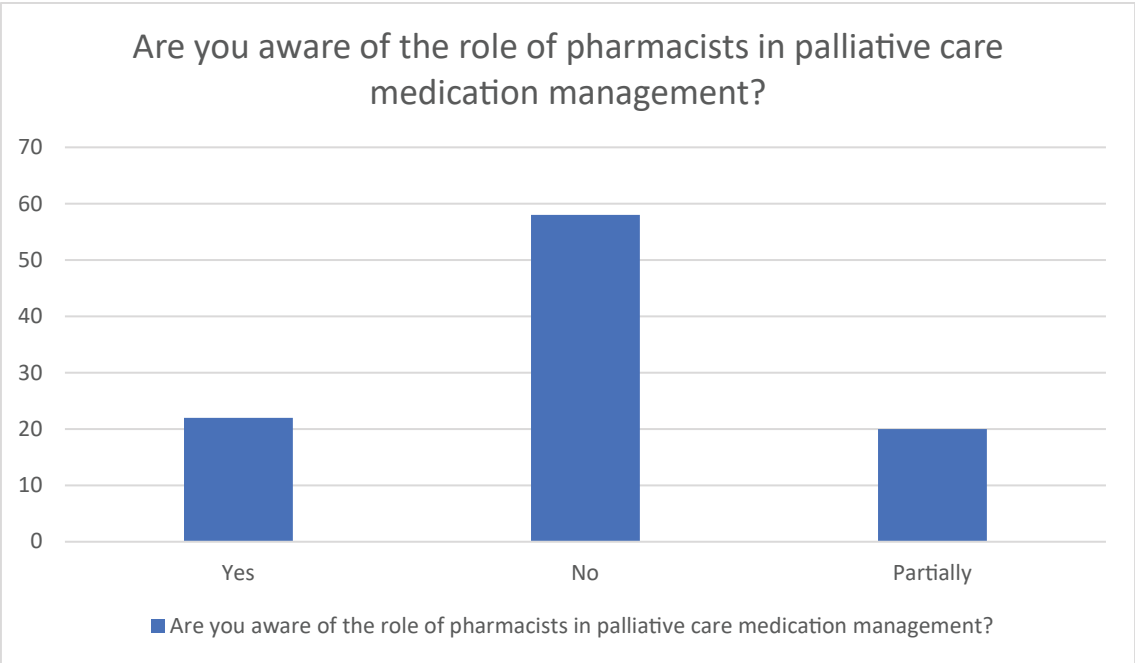


Figure 5. Graph regarding table 3 parameters

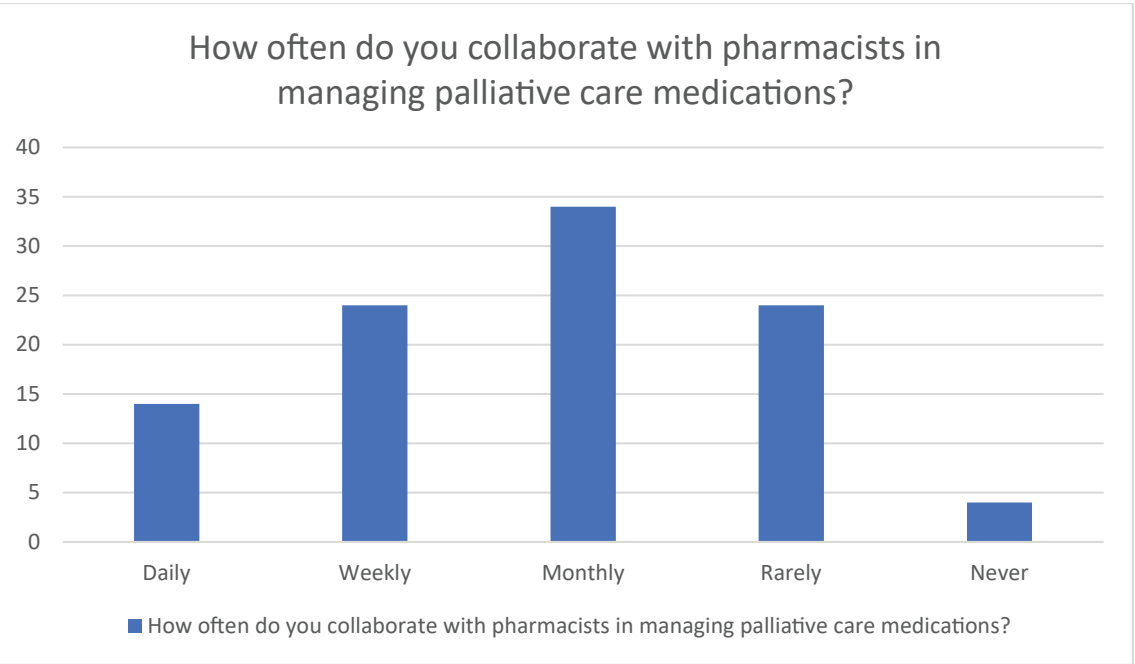


Figure 6. Graph regarding table 3 parameters



Figure 7. Graph regarding table 3 parameters

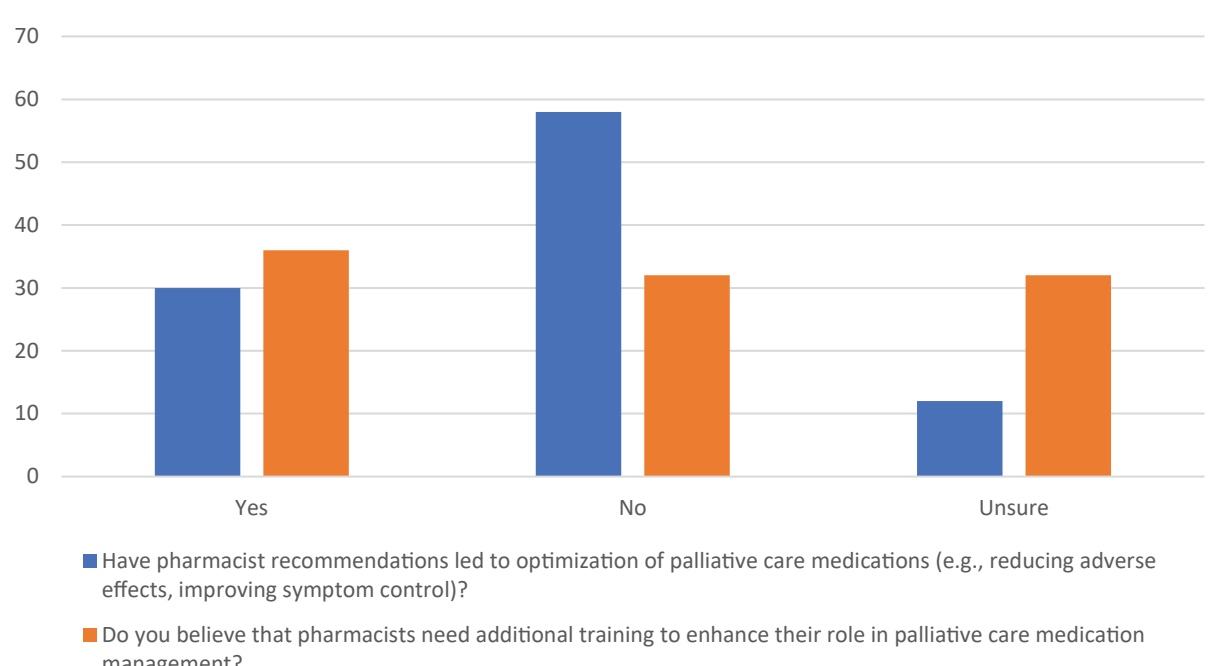


Figure 8. Graph regarding table 4 parameters

with the palliative care provider: 34% have monthly contacts, and another 24% contact weekly (Figure 9). Finally, on the perceived impact resulting from pharmacist involvement on medication safety and efficacy, largely, positive views were expressed: 44% of the responders perceived a moderate, and 8% significant improvement. However, 40% observed no change, thus indicating variability in effectiveness coming out from pharmacist interventions.

The participants' compliance to the pharmacist's

recommendations still remained at a medium level, with only 48% of the respondents following them "sometimes," while as few as 6% did so "always." Partial compliance may hamper the optimization of palliative care medications and thus impact the improvement of the patient's outcome.

Several obstacles to effective collaboration were identified, relating to the non-availability of pharmacists 38%, followed by communication problems 28%, and finally, lack of time 8%. These barriers are further supported through literature whereby

Mitchell, 2016, emphasized that improved communication and earlier care planning could result in better outcomes for palliative care (Figure 10).

Overall, 48% were neutral about pharmacist involvement, and 28% were dissatisfied. Some of the improvements suggested by participants included expanding the roles and responsibilities of pharmacists to 38%, their placing as medication management specialists within the palliative care team to 34%, and improving

education and training to 14%. Results from this study are consistent with previous literature related to the roles of a pharmacist in the delivery of palliative care. According to Johnson, 2023, and Smith, 2022, pharmacists play an important role in optimizing patient outcomes and the quality of life for patients receiving palliative care. The authors put much emphasis on comprehensive medication management, patient education, and multi-disciplinary collaboration among health teams (Figure 11).



Figure 9. Graph regarding table 4 parameters

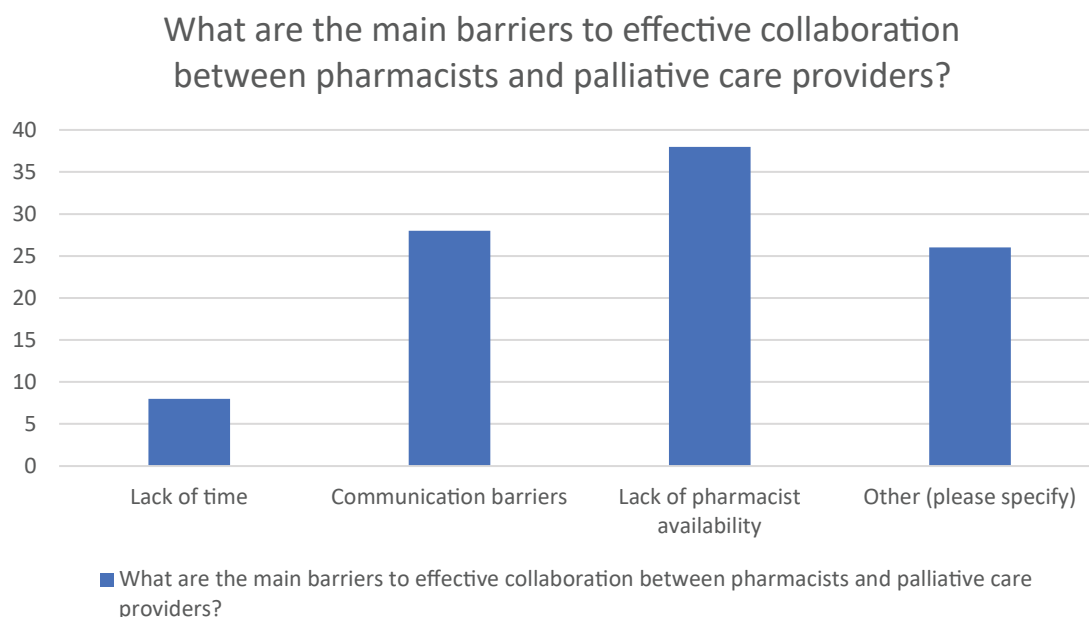


Figure 10. Graph regarding table 4 parameters

Overall, how satisfied are you with the current level of pharmacist involvement in palliative care medication management?

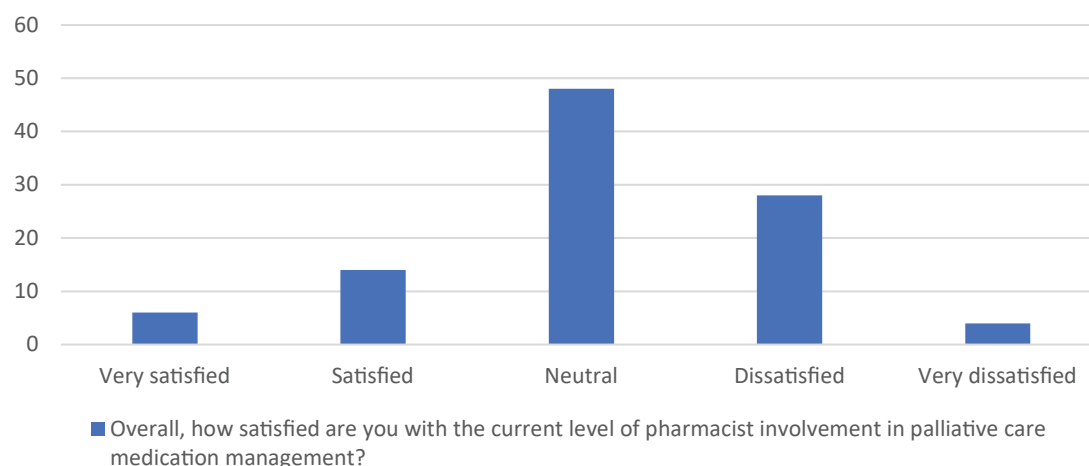


Figure 11. Graph regarding table 4 parameters

Coyne et al. (2017) and Morrison & Mitchell (2016) have highlighted best practice models that included pharmacists in the palliative care team to assure appropriate medication management. Integration at all levels will aid in reducing the associated risks of polypharmacy and ensure personalized therapeutic strategies.

It is in that regard that Ferrario et al. (2018) and Sally-Anne Francis & Sarah Yardley, 2021 again remarked on the fact that there was a need for stakeholder engagement and systematic reviews if the potential for pharmacy expertise in palliative care is to be understood and improved. Such works support our findings about the need for improved communication, collaboration, and an expanded role of pharmacists.

Bates et al. and Smith et al. have gone ahead to comment on the meaningful use of clinical decision support systems and electronic health records to improve care coordination and medication safety. Such technological interventions could help surmount some of the logistical issues we noted in our study.

Additionally, Tammie Lee Demler (2016) underscores the crucial involvement of pharmacists in hospice and palliative care, emphasizing the need for specialized training and consistent integration within care teams to optimize medication management and patient outcomes. Demler's study aligns with our findings, highlighting that pharmacists' interventions, when appropriately integrated, significantly improve the quality of care in palliative settings. The evidence suggests that enhancing pharmacists' roles can lead to better symptom control and more personalized medication regimens, ultimately improving patients' quality of life during palliative care.

Furthermore, the systematic review by Fernandes et al. (2021) on mobile health applications for medication adherence offers

valuable insights into the potential of technology to support palliative care patients. The review highlights that mobile health applications can significantly enhance medication adherence by providing timely reminders and educational resources. This technological approach could address some of the logistical barriers identified in our study, such as the non-availability of pharmacists and communication issues, by ensuring that patients have continuous access to medication information and support.

In terms of improving care coordination, Smith et al. (2021) discuss the integration of electronic health records (EHRs) in palliative care as a pivotal step towards better medication management and patient outcomes. The implementation of EHRs facilitates seamless communication between pharmacists and other healthcare providers, ensuring that all team members have access to up-to-date patient information. This can lead to more accurate and efficient medication reconciliation processes, reducing the risk of adverse drug events and enhancing overall patient safety. Our findings resonate with this perspective, indicating that enhanced technological support and systematic coordination are vital for optimizing the role of pharmacists in palliative care.

CONCLUSION

This study underlines the main role of a pharmacist in medication management for palliative care; however, it goes ahead to reveal certain considerable gaps in pharmacist involvement and patient perception. Even if the interventions by pharmacists might improve the safety and efficiency of medications, their engagement has been very few and different. Problems to be addressed include the barriers posed by communications, non-availability, and time constraints, which go hand-in-hand with

the enhancement of pharmacists' education and extension of their roles for the optimization of palliative care outcomes. Future research should focus on strategies to overcome these

barriers and ensure that pharmacists are integrated into the palliative care team so they can provide valuable input into patient-centered care.

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