

1 **Palliative Care Knowledge, Among Physicians**  
2 **in King Abdullah Medical City, Makkah, Saudi**  
3 **Arabia, 2024, Cross Section Study**

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17 **ABSTRACT**

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**Aims:** To estimate the level of understanding of non-palliative physicians regarding the palliative approach and to identify areas of weakness in their management of advanced terminal symptoms.

**Study Design:** An observational study was conducted among physicians at a single center using a cross-sectional design.

**Location and Duration of Study:** King Abdullah Medical City, Makkah, Kingdom of Saudi Arabia.

**Methodology:** The sample size was determined using ROA software based on the number of physicians. A validated survey was used from a comparable study conducted in Vietnam. The data was transmitted via an electronic iteration of the authorized survey. Statistical significance will be assessed using a significance level of  $P < 0.05$  and a confidence range of 95%.

**Results:** The study included a sample size of 80 individuals, with the highest proportion (37.5%) belonging to the age group of 31-40 years. The findings revealed that 57.5% of the participants have knowledge about comprehensive and appropriate palliative care. The study found significant positive correlations between healthcare provider practices and education ( $r: 0.360, P < 0.001$ ), as well as comprehensive Palliative Care Practices ( $r: 0.476, P < 0.001$ ). A negative correlation was seen between knowledge and belief of end-of-life ( $r = -0.358, P < 0.001$ ). Statistically significant correlations were observed between knowledge of palliative care and age ( $p = 0.028$ ), degree ( $P < 0.001$ ), and clinical practice area ( $P = 0.004$ ). The pain management category showed a significant positive correlation with healthcare providers and practices ( $r: 0.316, P = 0.004$ ).

**Conclusion:** The findings revealed that physicians possessed insufficient knowledge in the areas of pain management and palliative care. Knowledge levels are associated with age, educational attainment, and beliefs about end-of-life care. The study recommended the implementation of additional specialized facilities and the establishment of more efficient palliative care education programs.

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*Keywords: knowledge, pain management, palliative care, physicians*

## 21 1. INTRODUCTION

22

23 Palliative care is considered a specialty with a holistic approach, as defined by the World  
24 Health Organization (WHO), palliative care is the specialty that alleviates patient suffering  
25 including physical symptoms e.g. Pain as well as psychosocial and spiritual suffering.  
26 However, access to palliative care is limited in low and middle-income countries compared to  
27 high-income countries [1].

28

29 The goal of Palliative Medicine is to enhance the quality of life for patients and their families  
30 who are dealing with life-threatening diseases, not just at the end of life. Several challenges  
31 are associated with palliative care, such as the lack of specialized training for doctors and the  
32 availability of some medications such as opioids [2]. According to current data, it is expected  
33 that a significant portion of the global population will require palliative care due to various long-  
34 term conditions approach towards the end-of-life phase [3].

35

36 In many cases, the terminal phase is no longer a single event that leads to death but becomes  
37 an extended process that can last months or even years depending on the illness.  
38 [4].

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41 Improving quality of life through appropriate care during this stage is vital from a human rights  
42 perspective, public health standpoint, and in pursuit of equitable end-of-life care. There is a  
43 global consensus on prioritizing citizens' access to palliative care as part of this human rights  
44 objective [5].

45

46 To ensure comprehensive care for patients in their final stages of life, it is crucial to attain an  
47 appropriate level of knowledge. Additionally, exposure to palliative care within clinical training  
48 years is important either as the undergraduate or postgraduate level. This includes addressing  
49 topics related to death and caregiving while raising awareness among the general population  
50 about palliative care [6].

51

52 Ensuring a good quality of life for patients at the terminal stage leads to a big challenge for  
53 resident doctors that evolved beyond a curative approach, now encompassing a more holistic  
54 and humanized perspective with a focus on the biopsychosocial aspects of care [7].

55

56 Drawing from existing studies on palliative care practices worldwide, this research aims to  
57 estimate knowledge of palliative care among non-palliative physicians [8,9].

58

59 The researcher's rationale is based on one similar study conducted in Vietnam in 2019, they  
60 selected this topic based on real clinical experiences that have highlighted a lack of  
61 understanding in managing palliative symptoms, providing end-of-life care, and stabilizing  
62 palliative cases.

63

## 64 2. LITERATURE REVIEW

65 In 2019 Lulu Tsao and colleagues conducted a study on the knowledge, attitudes, and self-  
66 assessment of physicians in Vietnam regarding palliative care [6]. The study was conducted via a  
67 valid survey composed of 3 categories to assess palliative care. The survey assesses pain,  
68 opioid prescription, physical symptoms, psychological, social, spiritual, ethics, communications,  
69 and principles of palliative care. The Cronbach has been used to measure internal consistency  
70 with a very good internal consistency result. The sample size of this study was 392, with a  
71 reduced p-value of 0.0014 considered statically significant. Speaking about sample size about

72 one-third work in cancer centers, one-third in general medicine units, and 15 % work at HIV  
73 units.

74

75 Most participants did not receive a previous education in palliative specialty. 90 % of them  
76 have been prescribed narcotics previously for pain mainly and less for shortness of breath.  
77 The results show that 75 % have appropriate medical attitudes but they answer only 44 % of  
78 knowledge questions correctly. 8% believed they had adequate learning and only 11 % felt  
79 they had adequate pain training [10].

80

81 Lulu Tsao conducted further study based on his survey of palliative care knowledge among  
82 physicians, in this study, he involved 392 physicians post comprehensive courses that last  
83 from 6 to 18 months. In this period Tsao used different models of learning either theoretical or  
84 bedside clinical. Post-training the result shows a significant increase in knowledge, self-  
85 assessment, and attitude with p p-value of 0.001 which is considered significant [11].

86

87 Dr. Pohl from the Medical University at Vienna conducted a survey to compare the old vs new  
88 curriculum with establishing palliative care teaching in the new one. This study was conducted  
89 between 2 groups, the first one was a 149 interns' group and the second group was 4th year  
90 medical students. Both groups show significant willingness to learn more about palliative care  
91 and from here a new suggestion was raised to introduce palliative care at medical college  
92 grades to improve future medical physicians' knowledge [12].

93

94 In 2021, Jaimi Martin published a cross-sectional study that was conducted in 600 healthcare  
95 professionals, 226 nurses, and 335 physicians, a total of 34.4 % of nurses and 67. 4 % of  
96 physicians show good to excellent knowledge. Physicians' scores for pain, dyspnea, and  
97 psychiatric disorders were greater than those of the nurses. Nurses scored significantly better  
98 in philosophy. Considering factors affecting knowledge the age and work experience of  
99 physicians and undergraduate training in nurses had significant weight in knowledge. This  
100 result leads us to suggest developing continuous training and enhancing undergraduate  
101 training in palliative care will lead to improved patient care at the end of life [13]. The objective  
102 of this study is to estimate the knowledge of a palliative approach to non-palliative physicians  
103 and to identify weak points regarding managing advanced terminal symptoms in non-palliative  
104 physicians.

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### 108 **3. MATERIAL AND METHODS**

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#### 110 **3.1 Study Design and Population**

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112 This is a cross-sectional, single-center, observational study among physicians working in King  
113 Abdullah Medical City, Makkah, KSA, 2024. Included in the study are physicians of both  
114 genders, from any age at oncology, hematology, and emergency department physicians. The  
115 physicians who are currently working in the palliative department, Physicians who refused to  
116 participate, and Undergraduate physicians are excluded from this study. 80 sample size  
117 calculated via ROA soft based on the physicians' number at the ER, hematology, and oncology  
118 departments in King Abdullah Medical City, Makkah, KSA.

119

#### 120 **3.2 Data Collection and Management**

121

122 A valid survey from a similar study conducted at Vietnam was used, the surveys are a standard  
123 quantitative method to uncover misconceptions or misunderstandings in a specific population  
124 about a specific topic.

125 The data was delivered through an electronic version of the valid survey and this data not  
 126 show any nominative information, after verification, data transferred to a secured statistical  
 127 database.

128

### 129 **3.2 Statistical Analysis**

130

131 Data were analyzed using statistical product and service solution (SPSS), software version 23  
 132 (IBM Corp., Armonk, New York). For data analysis, descriptive statistics was applied to all  
 133 variables. Proportion and frequency for qualitative variables mean and standard deviation for  
 134 quantitative variables if normally distributive, and by median and interquartile range if not  
 135 normally distributed. Analytic statistics was applied in the form of Chi-Square test for  
 136 qualitative variables, and t-test for quantitative variables. Statistical significance was  
 137 considered at P value < 0.05 and a Confidence interval of (95%).

## 138 **4. RESULTS**

139

140 This cross-sectional study included a total of 80 participants, with the greatest percentage  
 141 (37.5%) falling within the age range of 31-40 years. The majority of participants were male  
 142 (70%) who had a Master of Science degree with the job title of Assistant Consultant. The  
 143 participants' area of expertise in clinical work was specifically in Emergency Medicine, as  
 144 indicated in Table 1.

145

146 **Table 1. Demographic characteristics of 80 study samples.**

Demographics	N	Min	Max	Mean	SD
Age	80	26	56	36.91	7.8
			<b>Count</b>		<b>%</b>
Total			80		100.0
Age		<=30	24		30.0
		31-40	30		37.5
		>40	26		32.5
Gender		Male	56		70.0
		Female	24		30.0
Degree		Consultant	17		21.3
		M.Sc (Assistant Consultant)	32		40.0
		Board (Resident)	20		25.0
		Fellow	8		10.0
		MBBS (General practitioner)	3		3.8
Area of clinical work		Emergency Medicine	37		46.3
		Hematology	16		20.0
		Oncology	27		33.8

147

148 Table 2 presents the participants' knowledge of palliative care. A study revealed that 52.5%  
 149 of the participants were aware that non-opioid analgesics, such as paracetamol or ibuprofen,  
 150 are the preferred initial treatment for cancer pain. 87.5% of the participants were aware that  
 151 the presence of prolonged pain, even after receiving treatment with codeine and paracetamol,  
 152 was a clear indicator to initiate the use of morphine. However, a mere 53.8% of the individuals  
 153 accurately recognized the negative consequence of morphine, namely angioedema.

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155

156 **Table 2. Assessment of Physicians knowledge of palliative care.**

157

Variables		Count	%	Incorrect	Correct
Total		80	100.0		
What type of pain is often difficult to control, even with morphine?	Somatic pain	15	18.8	41(51.3)	39(48.8)
	Visceral pain	11	13.8		
	Neuropathic pain	39	48.8		
	Bone pain	15	18.8		
A patient with pain or dyspnea who has not taken any opioids in the past should be started on what oral dose?	10-20 mg every 8 hours as needed	10	12.7	47(59.5)	32(40.5)
	10-20 mg every 4 hours as needed	4	5.1		
	5-10 mg every 4 hours as needed	32	40.5		
	1-2 mg every 4 hours as needed	33	41.8		
	Missing	1			
According to the WHO analgesic ladder, what should be the first treatment for cancer pain?	A mild opioid such as codeine	14	17.5	38(47.5)	42(52.5)
	Nonopioid analgesics such as paracetamol or ibuprofen	42	52.5		
	Morphine	14	17.5		
	Reassurance	10	12.5		
What is a typical indication for starting morphine?	Pain with swallowing in patients with AIDS.	2	2.5	10(12.5)	70(87.5)
	Persistent pain despite treatment with codeine and paracetamol in patients with cancer.	70	87.5		
	Mild chronic lower back pain in patients who do not have cancer.	2	2.5		
	A patient with cancer and bony metastases but without pain.	6	7.5		
Which of the following is not a common side-effect of morphine?	Nausea	6	7.5	37(46.3)	43(53.8)
	Sedation	13	16.3		
	Constipation	18	22.5		
	Angioedema	43	53.8		
What does it mean if a cancer patient who has pain is physically dependent on morphine?	They may start taking extra doses of morphine compulsively, even when they do not have pain.	30	37.5	62(77.5)	18(22.5)
	A patient may begin to think about morphine all the time.	17	21.3		
	If morphine use suddenly stops, patients will experience withdrawal symptoms.	18	22.5		

	If their pain goes away, the patient will want to keep taking the morphine	15	18.8		
What does pseudo-addiction mean?	The patient has addictive behavior but has well-controlled pain	33	41.3		
	The patient has addictive behavior that is not improved when additional doses of morphine are given.	13	16.3		
	The patient has addictive behavior but is willing to admit his addiction.	19	23.8	47(58.8)	33(41.3)
	The patient has addictive behavior but also has uncontrolled pain.	15	18.8		
All of the following medications can be used to control nausea except:	Haloperidol	20	25.0		
	Metoclopramide	9	11.3		
	Dexamethasone	17	21.3	46(57.5)	34(42.5)
	Amitriptyline	34	42.5		
What is an appropriate morphine dose for breakthrough pain?	5 mg of morphine	39	49.4		
	10 mg of morphine	8	10.1		
	5-15% of the daily dose	19	24.1	60(75.9)	19(24.1)
	15-25% of the daily dose	13	16.5		
	Missing	1			
Which of the following is not included in an ideal, complete palliative care assessment?	Disease history and physical symptoms	9	11.3		
	Psychological symptoms	5	6.3		
	Decision-making capacity	9	11.3	34(42.5)	46(57.5)
	Spiritual needs	5	6.3		
	Practical needs and anticipatory planning for death	6	7.5		
	All of the above are included.	46	57.5		
Which of the following is a stimulant laxative at conventional doses?	Bisacodyl	38	47.5		
	Sodium docusate	22	27.5	42(52.5)	38(47.5)
	Mineral oil	9	11.3		
	Oral naloxone	11	13.8		
When a dying patient is treated with morphine for breathlessness, the drug is titrated based on:	Respiratory rate	40	50.0		
	Pulse oximetry	6	7.5		
	Patient's comfort	28	35.0	52(65.0)	28(35.0)
	Blood pressure	6	7.5		
	Scopolamine	16	20.0		
	Metoclopramide	42	52.5	38(47.5)	42(52.5)

Which of the following antiemetics acts primarily at dopamine receptors?	Haloperidol	14	17.5		
	Diphenhydramine	8	10.0		
In discussing an uncertain prognosis, it is best to:	Reassure the patient and family that all will be well	16	20.3		
	Warn the family that the outcome is likely to be poor	17	21.5	42(53.2)	37(46.8)
	Discuss possible outcomes, including likelihood	37	46.8		
	Say that no one knows what will happen	9	11.4		
	Missing	1			
When should palliative care be initiated?	When a patient is actively dying	11	13.8		
	When a patient has a lot of symptoms such as pain or shortness of breath.	38	47.5	49(61.3)	31(38.8)
	When a patient is first diagnosed with metastatic cancer.	31	38.8		
Objectives of palliative include	Maintain life by any means	2	2.5		
	Promote adherence to ARV or cancer therapy.	3	3.8	44(55.0)	36(45.0)
	Improve quality of life	16	20.0		
	All of the above	23	28.8		
	B and C	36	45.0		
Palliative care can be provided	In an outpatient setting.	2	2.5		
	In the hospital.	15	18.8		
	b and c only.	11	13.8	28(35.0)	52(65.0)
	All of the above.	52	65.0		
Ethical issues in palliative care include	Social justice.	4	5.1		
	Autonomy.	3	3.8		
	Beneficence.	1	1.3		
	Non-maleficence.	1	1.3	17(21.5)	62(78.5)
	Assuring that patients do not die in pain.	8	10.1		
	All of the above.	62	78.5		
	Missing	1			
Breaking bad news well is important because	It saves time.	1	1.3		
	The patient can be harmed emotionally if bad news is given in an inappropriate way.	9	11.4	45(57.0)	34(43.0)
	When it is given well, the patient /doctor relationship is strengthened.	11	13.9		

	All of the above.	34	43.0		
	b and c only.	24	30.4		
	Missing	1			
Important parts of the psycho-social assessment include:	Living situation.	3	3.8	17(21.8)	61(78.2)
	Financial status.	4	5.1		
	Family caregiver.	7	9.0		
	Community support.	3	3.8		
	All of the above.	61	78.2		
	Missing	2			
Which of the medicines below does not cause constipation?	Iron sulfate	4	5.1	30(38.0)	49(62.0)
	Anticholinergic	20	25.3		
	Anti-viral.	49	62.0		
	Opioids.	6	7.6		
	Missing	1			

158

159 The results additionally indicated that 57.5% of the participants possess knowledge about the  
 160 comprehensive and optimal palliative care, including the understanding of disease history and  
 161 physical symptoms, psychological symptoms, decision-making ability, spiritual requirements,  
 162 practical needs, and preparation for death. Over 50% of the participants were aware that  
 163 metoclopramide predominantly targets dopamine receptors.

164

165 Regarding the location of palliative care provision (65%) of ethical problems related to  
 166 palliative care (78.5%), as well as significant aspects of psycho-social assessment (78.2%)  
 167 and non-constipating medicines (62%), were answered correctly by over half of the  
 168 participants.

169

170 Table 3 displays the reliability data for the palliative care scales. The Cronbach's Alpha values  
 171 for Healthcare Provider Practices and Education in Palliative Care, Competence and Training  
 172 in Palliative Care, Pain Management and Knowledge of Palliative Care, and Healthcare  
 173 Provider Concerns are 0.767, 0.596, 0.620, and 0.694, respectively. The values suggest that  
 174 the scales demonstrate good internal consistency, indicating a moderate level of reliability.  
 175 The Cronbach's Alpha for Comprehensive Palliative Care Practices is 0.847. This scale  
 176 exhibits strong internal consistency, indicating a high level of reliability in assessing complete  
 177 palliative care methods. The Healthcare Provider Concerns survey yielded a Cronbach's  
 178 Alpha coefficient of 0.711. The scale has strong internal consistency, indicating high reliability  
 179 in assessing healthcare provider concerns pertaining to palliative care. However, the Beliefs  
 180 About End-of-Life Care scale and the Positive Palliative Approach scale had Cronbach's Alpha  
 181 values of 0.306 and 0.22, respectively. The scales demonstrate a lack of strong internal  
 182 consistency, indicating a low level of reliability.

183

184 **Table 3. Reliability statistics of the Study domains using Cronbach's alpha.**

185

Reliability Statistics	Cronbach's Alpha	N of Items
Healthcare Provider Practices and Education in Palliative Care	0.767	10
Comprehensive Palliative Care Practices	0.847	9
Competence and Training in Palliative Care	0.596	4
Beliefs About End-of-Life Care	0.306	3
Positive Palliative Approaches	0.277	3
Pain Management	0.620	7
Healthcare Provider Concerns	0.711	7
Knowledge on Palliative Care	0.694	21

186 Table 4 presents the correlation analysis between healthcare provider practices and  
 187 education, and other domains. The study revealed a significant and positive relationship  
 188 between Healthcare Provider Practices and Education in Palliative Care, Comprehensive  
 189 Palliative Care Practices (r:0.638, p<0.001), and Competence and Training in Palliative Care  
 190 (r:0.645, p<0.001). This implies that increased involvement in palliative care practices and  
 191 education leads to more extensive palliative care practices and training. The pain  
 192 management category exhibited a significant positive association with healthcare providers  
 193 and practices, suggesting that increased involvement in palliative care practices and education  
 194 leads to improved pain management practices (r: 0.316, p=0.004). The Positive Palliative  
 195 Approaches exhibited a modest positive association, indicating that a greater level of  
 196 involvement in palliative care practices and education is associated with a higher prevalence  
 197 of positive palliative approaches (r: 0.207, p=0.066). The study did not find any statistically  
 198 significant correlations between beliefs regarding end-of-life care (r: -0.082, p=0.468) and  
 199 Health care provider worries (r:0.153, p=0.174).

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 201  
 202

**Table 4. Correlation of each domain to other palliative care domains.**

<b>Correlations</b>		<b>Compre hensive Palliati ve Care Practi ces</b>	<b>Compe tence and Training in Palliati ve Care</b>	<b>Beliefs About End- of-Life Care</b>	<b>Positiv e Palliati ve Appro ches</b>	<b>Pain Manag ement</b>	<b>Healt hcare Provi der Conc erns</b>
<b>Healthcare Provider Practices and Education in Palliative Care</b>	r	0.638**	0.645**	-0.082	0.207	0.316**	0.153
	p-value	<0.001	<0.001	0.468	0.066	0.004	0.174
	N	80	80	80	80	80	80
<b>Comprehensive Palliative Care Practices</b>	r		0.610**	-0.179	0.202	0.422**	0.202
	p-value		<0.001	0.112	0.073	<0.001	0.072
	N		80	80	80	80	80
<b>Competence and Training in Palliative Care</b>	r			-0.134	0.324**	0.443**	-0.079
	p-value			0.237	0.003	<0.001	0.485
	N			80	80	80	80
<b>Beliefs About End-of-Life Care</b>	r				-0.089	-0.016	-0.018
	p-value				0.435	0.890	0.873
	N				80	80	80
<b>Positive Palliative Approaches</b>	r					0.206	0.291*
	p-value					0.067	0.009
	N					80	80
<b>Pain Management</b>	r						-0.064
	p-value						0.571
	N						80

\*\* Correlation is significant at the 0.01 level (2-tailed).

203

204 Strong favorable relationships were seen between healthcare provider practices and education  
205 (r:0.360,  $p= 0.001$ ) as well as complete Palliative Care Practices (r:0.476,  $p < 0.001$ ).  
206 These findings suggest that a stronger understanding of palliative care is linked to improved  
207 behaviors, more thorough care, and enhanced competence and training.  
208 The presence of these notable positive correlations indicates that having knowledge of  
209 palliative care is linked to enhanced practices, comprehensive care, and competence.  
210 This supports the validity of the scales in measuring these constructs. Conversely, a notable  
211 negative association was seen between Knowledge and thoughts regarding end-of-life  
212 (r:-0.358,  $p=0.001$ ). Higher proficiency in palliative care is linked to a reduction in negative  
213 attitudes towards end-of-life care. The study did not find any statistically significant connections  
214 between Positive Palliative Approaches (r:0.098,  $p = 0.388$ ) and Healthcare Provider Concerns  
215 (r:0.221,  $p = 0.049$ ). Consequently, there is no correlation between knowledge of palliative care  
216 and the implementation of effective palliative approaches or the concerns of healthcare providers.  
217

218

## 219 5. DISCUSSION

220

233 The knowledge of palliative care among physicians in King Abdullah Medical City, Makkah,  
234 Saudi Arabia, was determined and evaluated in this study. Palliative care knowledge is  
235 particularly important for physicians, as they are the primary providers of patient care. Training  
236 and exposure are factors that influence palliative care knowledge. Although some physicians  
237 have a comprehensive knowledge, others may have limited awareness, which can affect the  
238 quality of patient care.

239

240 The findings of the research indicated that the physicians' understanding of palliative care was  
241 limited. The optimal and comprehensive palliative care was correctly determined by only  
242 57.5% of the participants. Teng et al [2] conducted a cross-sectional study in Shanghai, China,  
243 which yielded a similar outcome. The mean correctness of the responses related to knowledge  
244 was 59.30%. The KAPHC scale was employed in their investigation to evaluate the  
245 knowledge, attitude, and practice of healthcare providers. The results indicated that higher  
246 KAPHC scores were correlated with experience and willingness, and that they varied based  
247 on professional specializations. The palliative care knowledge of the nurses and physicians  
248 was assessed using the Palliative Care Knowledge Test (PCKT) in the study conducted by  
249 Martín-Martín et al. [1]. A total of 34.41% of the nurses and 67.40% of the physicians exhibited  
250 adequate or excellent knowledge of palliative care.

251

252 The present study yielded a significantly higher result than the clinicians who participated in  
253 the study conducted by Abdel Gawad et al. [4] in primary clinics in Kuwait. Palliative care  
254 services were unfamiliar to 62.7% of the physicians, while only 6.7% possessed a high level  
255 of knowledge. The study conducted by Swed et al. [7] also demonstrated that only 14 out of  
256 602 participants, including students, nurses, and physicians, are considered to possess

257 knowledge of palliative care. The study conducted by Tsao et al. [6] in Vietnam also revealed  
258 a lack of knowledge regarding palliative care. Only 8% of the participants felt that they were  
259 adequately trained in palliative care, and the mean knowledge assessment score was 44%.  
260 The observed discrepancy in the results could be attributed to a variety of factors, such as  
261 variations in the study population's characteristics, including occupation, educational  
262 attainment, work ward, and the outcome of a palliative care training program.  
263

264 Effective pain management for individuals with terminal illnesses is one of the primary goals  
265 of palliative care. Opioids are essential for pain treatment, as they are a reliable indicator of  
266 the availability of primary care and the efficacy of pain management [12]. The WHO three-step  
267 ladder strategy for cancer pain treatment in adults has demonstrated that the successful  
268 treatment of cancer pain in adults is cost-effective and obtains a success rate of 80-90% when  
269 the appropriate medication is administered at the correct dosage and timing [11]. The initial  
270 treatment for cancer pain, which is morphine, was correctly identified by only over half of the  
271 physicians in this study. Additionally, physicians demonstrated inadequate comprehension  
272 regarding the management of morphine's adverse effects.  
273

274 Scales were implemented in the present investigation to assess physicians' proficiency. The  
275 findings suggest a robust correlation between knowledge and two factors: Comprehensive  
276 Palliative Care Practices and Health Care Provider Practices and Education ( $r: 0.476, p <$   
277  $0.001$ ). One can develop a higher level of proficiency in palliative care by utilizing appropriate  
278 methods and obtaining sufficient education. Ashrafizadeh et al. [13] establish a positive  
279 correlation between increased knowledge and attitude toward palliative care and higher levels  
280 of education. The knowledge and attitude of care professionals toward palliative care also  
281 increase as the degree of educational attainment increases. It is evident that an increase in  
282 educational attainment will lead to a proportionate increase in professional expertise and  
283 knowledge. It seems that care professionals who have completed more extensive education  
284 programs obtain more comprehensive knowledge regarding palliative care. The results of the  
285 experiments conducted by Balicas [8] and Yamamoto et al. [10] were consistent.  
286

287 The study's results indicated that age is a factor in the acquisition of knowledge in Palliative  
288 Care. The correlation between age and knowledge of PC has been the subject of varying  
289 results in previous studies. There were no significant associations between age and  
290 knowledge of PC in the study conducted by Ansari et al. [5]. Conversely, Ashrafizadeh et al.  
291 [13] and Nair et al. [14] reported a substantial correlation. While some studies suggest that  
292 younger physicians may possess more up-to-date theoretical knowledge, older physicians  
293 may possess a more profound, experience-based comprehension. Generally, it can be  
294 asserted that an individual's age has an impact on their ability to absorb information. The  
295 capacity to receive and analyze information increases as an individual matures, which is  
296 associated with the development of physical and cognitive functions.  
297

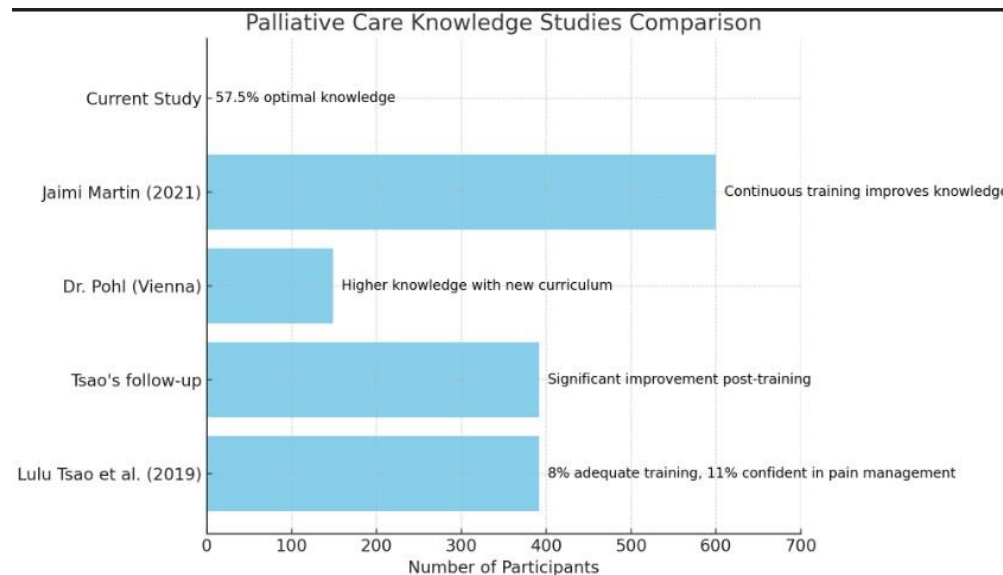
298 The level of education and the knowledge of palliative care are correlated in this study.  
299 Individuals who possess Master of Science degrees demonstrate superior knowledge in  
300 comparison to their peers, according to this investigation. The level of knowledge in palliative  
301 care is positively correlated with the level of education and training of individuals [3].  
302 Continuing education, whether acquired through structured instruction or autonomous study,  
303 is essential for the preservation and enhancement of a physician's knowledge and skill in  
304 palliative care throughout their professional career.  
305

306 The present investigation identifies a correlation between the comprehension of palliative care  
307 and the belief in the end-of-life. The research demonstrated that individuals who hold beliefs  
308 regarding the end of life exhibited a reduced level of comprehension. It is imperative to  
309 investigate the correlation between attitudes toward end-of-life treatment and an

310 understanding of palliative care, as these variables significantly influence patient outcomes.  
 311 Morstad Boldt [5] has demonstrated that physicians who possess inadequate knowledge or  
 312 misconceptions regarding palliative care are inclined to assume that palliative care is  
 313 exclusively administered during the terminal phase of life. These negative beliefs can be  
 314 addressed and improved patient outcomes can be achieved by increasing physician education  
 315 and awareness of palliative care. The results of a study conducted by Budkaew and  
 316 Chumworathayi [15] suggest that the integration of palliative care into the curriculum of  
 317 medical institutions can enhance the knowledge and favorable attitudes of physicians toward  
 318 the provision of end-of-life care to cancer patients. This is accomplished through the  
 319 dissemination of pertinent concepts and information regarding palliative care.

320  
 321 A comprehensive approach to palliative care is required, which includes the management of  
 322 symptoms, the development of communication skills for challenging conversations, and the  
 323 consideration of patients' emotional and spiritual requirements. Enhanced education and  
 324 ongoing professional development are essential for bridging knowledge gaps, ensuring that  
 325 all physicians can effectively collaborate within multidisciplinary teams to optimize the quality  
 326 of life for patients and their families and advocate for patient-centered care.

327



327

## 328 6. LIMITATIONS OF THE INVESTIGATION

329

330 There are potential limitations to the study. The generalization of the findings may be impacted  
 331 by the small sample size. However, the result's internal consistency was assessed using  
 332 Cronbach's alpha, and the results indicated moderate to excellent reliability. This small sample  
 333 size as study applied in a single center and this will be compensated in the future to involve many  
 334 center in future study. Lastly, the potential for response bias may have been increased by the  
 335 overestimation or underestimation of the questions that may have resulted from the use of a  
 336 self-reported questionnaire.

337

## 338 7. CONCLUSION

339 The present study's findings on palliative care knowledge physicians at King Abdullah Medical City  
 340 are consistent with previous research. They underscore the critical need for enhanced education  
 341 and training to bridge knowledge gaps and improve palliative care practices. By linking these  
 342 findings to the literature review, it is evident that comprehensive educational programs, Continuous  
 343 professional development and structured training are essential for equipping physicians with the  
 344 necessary knowledge and skills to provide optimal palliative care.

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362 **CONSENT**

363

364 Informed written consent was obtained from the participants prior to their participation.

365

366

367 **ETHICAL APPROVAL**

368

369 Ethical approval was obtained from the Research Ethics Committee of King Abdullah Medical  
370 City (Approval No. 24-1236; date of approval 26/3/2024). Additionally, this study was carried  
371 out in accordance with the declarations of Helsinki.

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375 **REFERENCES**

- 376 1. Martín-Martín J, López-García M, Medina-Abellán MD, Beltrán-Aroca CM, Martín-de-  
377 Las-Heras S, Rubio L, et al. Physicians' and Nurses' Knowledge in Palliative Care:  
378 Multidimensional Regression Models. *Int J Environ Res Public Health*. 2021;18(9).
- 379 2. Teng X, Tang M, Jing L, Xu Y, Shu Z. Healthcare Provider Knowledge, Attitudes, and  
380 Practices in Hospice Care and Their Influencing Factors: A Cross-sectional Study in  
381 Shanghai. *Int J Health Policy Manag*. 2022;11(12):3090-3100.
- 382 3. Hamdan KM, Al-Bashaireh AM, Al-Dalahmeh M, Saifan AR, Albqoor MA, Shaheen AM.  
383 Palliative care knowledge and attitudes toward end-of-life care among intensive care  
384 unit nurses in Jordan. *Acute Crit Care*. 2023;38(4):469-478.
- 385 4. Abdel Gawad W, Al-Ansari A, Suroor S, Aboserea S. Primary Care Physicians'  
386 Knowledge and Attitude towards Palliative Care. Is it time for integration? *Egypt J Geriatr*  
387 *Gerontol*. 2022;9(1):20-31.
- 390 5. Ansari MPC, Rassouli MP, Akbari MM, Abbaszadeh AP, Akbari Sari AP. Educational  
391 Needs on Palliative Care for Cancer Patients in Iran: A SWOT Analysis. *Int J Community*  
392 *Based Nurs Midwifery*. 2018;6(2):111-124.
- 393 6. Tsao L, Slater SE, Doyle KP, Cuong DD, Khanh QT, Maurer R, et al. Palliative Care-  
394 Related Knowledge, Attitudes, and Self-Assessment Among Physicians in Vietnam. *J*  
395 *Pain Symptom Manage*. 2019;58(6):1015-1022.e1010.
- 396 7. Swed S, Bohsas H, Alibrahim H, Albakri K, Rais MA, Almoshantaf MB, et al. Knowledge  
397 and Attitude of Healthcare Providers Regarding Palliative Care and Related Factors: An  
398 Online Cross-Sectional Study. *Cureus*. 2024;16(2):e54477.
- 399 8. Balicas MR. The effect of palliative care nursing education to improve knowlegde in  
400 palliative care of hospital-based nurses caring for patients with chronic, serious illness.  
401 Available: [https://hsrc.himmelfarb.gwu.edu/son\\_dnp/33](https://hsrc.himmelfarb.gwu.edu/son_dnp/33) Accessed on 30 June 2024
- 402 9. Paknejadi F, Hasavari F, Mohammadi T, Leili E. Nurses' Knowledge of Palliative Care  
403 and Its Related Factors. *J Holist Nurs Midwifery* 2019;29:236-242.
- 404 10. Yamamoto R, Kizawa Y, Nakazawa Y, Ohde S, Tetsumi S, Miyashita M. Outcome  
405 evaluation of the Palliative care Emphasis program on symptom management and  
406 Assessment for Continuous Medical Education: nationwide physician education project  
407 for primary palliative care in Japan. *J Palliat Med*. 2015;18(1):45-49.
- 408 11. World Health Organization. Cancer pain relief. Available:  
409 [https://iris.who.int/bitstream/handle/10665/43944/9241561009\\_eng.pdf](https://iris.who.int/bitstream/handle/10665/43944/9241561009_eng.pdf) Accessed on  
410 22 June 2024
- 411 12. Manjiani D, Paul DB, Kunnumpurath S, Kaye AD, Vadivelu N. Availability and utilization  
412 of opioids for pain management: global issues. *Ochsner J*. 2014;14(2):208-215.

- 413 13. Ashrafizadeh H, Mojen L, Barasteh S, Beiranvand S, Farahani A, Eshaghian Dorcheh  
414 A, et al. Factors Related to Nurses and Physicians' Knowledge of and Attitudes Towards  
415 Palliative Care. *Int J Cancer Manag.* 2021;15(2):e122653.
- 416 14. Nair DN, Paul AS, Raveendran KU. Palliative care development in India: new WHO  
417 conceptual model. *BMJ Support Palliat Care.* 2023;13(3):298-304.
- 418 15. Budkaew J, Chumworathayi B. Knowledge and attitudes toward palliative terminal  
419 cancer care among Thai generalists. *Asian Pac J Cancer Prev.* 2013;14(10):6173-6180.

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