RESEARCH ARTICLE

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Caregivers' Knowledge of and Attitude towards Palliative Care in Iran

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Abstract

Background: Addressing the palliative care needs requires clinicians to have sufficient knowledge of and positive attitudes toward palliative care. The study aimed to determine nurses' and physicians' knowledge of and attitudes towards palliative care in Iran. **Methods:** This descriptive cross-sectional study was conducted in 2021 on 493 physicians and nurses, selected through convenience sampling. Three online questionnaires addressing caregivers' demographic and professional's questionnaire, Health Care Providers' Attitude toward PC Questionnaire, and Health Care Providers' Knowledge of PC Questionnaire were used. The data was analyzed in SPSS using correlational and descriptive statistics and regression analysis. **Results:** The mean score of attitude towards palliative care was 142.03 ± 11.35 and the mean score of palliative care knowledge, 19.47 ± 2.62. Considering the regression coefficients between these two mean scores (P-value = 0.001, b = 1.304), it can be inferred that knowledge is a good predictor of attitude. In addition, the mean scores of knowledge and attitude have a significant relationship with age, female gender, holding a master's or PhD degree, the need for formal education in the field of palliative care and the need to take a palliative care course. **Conclusions:** The present study showed that Iranian nurses and physicians have a moderate level of knowledge and attitude towards palliative care. It is necessary to take measures in order to improve knowledge and attitude by holding retraining courses, theoretical and clinical training sessions and relevant seminars in short term, and also by integrating related topics into nursing and medical curriculums in long term.

Keywords: Knowledge- attitude- palliative care- caregiver- Iran

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Introduction

Palliative care (PC) is a vital care approach when it comes to life-threatening illnesses, the patients' lack of access to which is considered as a lack of human rights (Ansari et al., 2019). PC with the aim of improving the quality of life in patients and families has been emphasized by the World Health Organization (WHO) and the integration of these services into the health system is recommended to all countries (WHO, 2016; Idris et al., 2020). Palliative care should not be regarded as a luxury but a necessity and, the holistic approach of palliative care means that it is the business of all health care system (Tahmasebi et al., 2020). One of the three major steps to the establishment of this care approach is providing training for caregivers (Eshaghian-dorcheh et al., 2019).

Although addressing the PC needs of patients and their families requires adequate knowledge of PC standards tailored to the duties of each profession, the evidence indicates that the staff of various health disciplines has insufficient training and knowledge of symptom management and the skills needed in the field of PC

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(Barasteh et al., 2020; Mishra et al., 2020). On the other hand, attitude is influenced by knowledge and is an effective factor in improving performance. According to the conducted studies, caregivers with more knowledge of PC also have a more positive attitude towards PC (Azami-Aghdash S, 2015).

In Iran, PC is a new approach and the care givers' insufficient knowledge and lack of awareness and expertise with regard to these services, especially among physicians and nurses, is considered a barrier against the provision of PC services (Barasteh et al., 2020). It seems that one of the causes of this lack of knowledge is the poor education of physicians and nurses or professors and students' ignorance of this issue during their years of education (Khoshnazar et al., 2016). However, the WHO considers the academic education and the integration of this concept into medical and nursing curricula as a major component of the public health model (Stjernswärd J, 2007).

The results of the studies conducted in Iran show that nurses and nursing students do not have a positive attitude towards care provision for dying patients (Iranmanesh et al., 2009; Ashrafizadeh et al., 2022), and oncology and ICU nurses (Razban F, 2015a) as well as home care nurses have also a negative attitude towards PC (Dehghannezhad J, 2021). Studies have shown that nurses with a negative attitude towards PC avoid dealing with dying patients and transfer their fears, hopelessness and frustrations to the patient and his/her family. This attitude discourages patients from using these services or leads to their being referred for receiving service after the disease has progressed and the patient is in the end-of-life stages (Al-Ansari et al., 2020).

Since education will improve people's knowledge and attitude, the first step in curriculum development to empower caregivers in the provision of PC is to examine their attitudes and their level of knowledge in the current situation.

Although, so far, studies have been conducted in Iran to examine caregivers' knowledge and attitude using various tools (Estebsari and Taghdisi, 2015; Razban F, 2015b), limiting the research population to a specific group, as well as uncertainty about the validity and reliability of the implemented tools, are considered as the limitations of these studies. Therefore, in this study, while investigating physicians and nurses' knowledge of and attitude towards PC, an appropriate tool was developed and psychometrically evaluated in order to assess caregivers knowledge and attitude in order to determine the effectiveness of the following training courses.

Materials and Methods

Study setting and population

This descriptive cross-sectional study is conducted with the aim of determining physicians and nurses' knowledge of and attitude towards PC in Iran in 2021. The samples consisted of the nurses and the physicians working in various wards in Iranian hospitals who were selected through convenience sampling and filled out a standard online questionnaire from April to June 2021. A brief explanation of the research and its objectives were written and posted, along with the invitations, in several social network platforms including WhatsApp and Telegram. They were also published in social networks with a forwarding request to perform snowball sampling. Before seeing the questionnaire, the volunteers signed an online informed consent form. The sample size was calculated to be 400 according to Cochran's formula. 493 subjects completed the questionnaire at the end of the above-mentioned period.

Measurements

To collect data, three online questionnaires including caregivers' demographic and professional's questionnaire, Health Care Providers' Attitude toward PC Questionnaire, and Health Care Providers' Knowledge of PC Questionnaire were used. This tool has been designed and psychometric by Ashrafizadeh et al. In 2021 in Iran (Ashrafizadeh et al., 2022).

Health Care Providers' Attitude toward PC Questionnaire

This questionnaire consist of 37 items. The subscales included attitude towards principles of PC with 13 items ($\alpha = .68$), attitude towards family participation in PC with 6 items ($\alpha = 0.80$), attitude towards the end-of-life care with 9 items ($\alpha = 0.65$) and attitude towards patient's autonomy with 9 items ($\alpha = 0.70$). Cronbach's alpha for the whole scale was calculated to be 0.80. The questionnaire is scored on a 5-point Likert scale (5 = I strongly agree, 4 = I agree, 3 = I have no opinion, 2 = I disagree, 1 = I strongly disagree). The items 11, 13, 20, 21, 22, 23, 24, 28 and 29 are reverse scored and the option strongly disagree has 5 scores. The overall score of the subject's attitude is the sum of these 4 subscales, falling between 37 and 185.

Health Care Providers' Knowledge of PC Questionnaire

This questionnaire consists of 30 items. This questionnaire had 4 subscales including general concepts with 5 items, pain management with 9 items, physical symptoms management with 10 items and psychological symptoms management with 6 items. In this tool, each correct answer is given 1 point and each wrong answer receives none. The items 2, 3, 4, 5, 6, 10, 12, 17, 23, 28 and 30 are reverse scored where any wrong answer is given one point and any correct one, no point. The total score of knowledge is the sum of the scores of these 4 subscales, falling between 0 and 30. In other words, the higher the score in this scale, the more the caregiver's knowledge.

Analysis

In order to determine caregivers' knowledge and attitude, data analysis was performed using SPSS V26. After examining the normality of the data, descriptive statistics tests and the measures of dispersion were used to report the frequency. Independent sample T-test for normal variables and Mann-Whitney test, KrusKal-Wallis test for UN normal variables were done to determine the relationship between demographic variables, and knowledge and attitude. Spearman and Pearson's correlation tests were done to determine the correlations between knowledge and attitude. Finally, linear regression

was applied to determine the relationships between variables.

Results

A total of 493 physicians and nurses participated in the study whose demographic and professional information is displayed in Table 1.

The mean score of caregivers' attitude towards PC was 142.03 ± 11.35 and the mean score of caregivers' knowledge of PC was 19.47 ± 2.62 (Table 2). Table 3 shows the highest and lowest scores of items of the attitude questionnaire and the most correct and incorrect answers in the knowledge questionnaire.

Univariate regression was applied to examine the relationship of demographic and professional variables with the mean scores of caregivers' knowledge of and attitude towards PC, the results of which are shown in Table 4. According to the regression coefficients, the mean score of knowledge has a significant relationship with the

Table 1. Demographic and Professional Characteristics of the Participants in the Study (n=493)

Variables		Frequency	Percentage
Age (year)	20-30	99	20.1
	31-40	210	42.6
	41-50	146	29.6
	51-60	35	1-Jul
	61<	3	0.6
Sex	Female	425	86.2
	Male	68	13.8
Educational status	Bachelor	352	71.4
	Master of sciences	114	23.1
	Medical Doctor	5	1
	PhD	21	4.3
	Fellowship	1	0.2
Job	General Practitioner	3	0.6
	Oncologist	1	0.2
	Nurse	437	88.6
	Faculty member	24	4.9
	Other	28	5.7
work experience (year)	>1	17	3.4
	1-3	30	6.1
	4-5	32	6.5
	6-10	98	19.9
	<10	316	64.1
Workplace ward	Internal ward	26	5.3
	Surgery ward	19	3.9
	Maternity ward	13	2.6
	Emergency	34	6.9
	Pediatrics	9	1.8
	CCU	73	14.8
	ICU	46	9.3
	Hematology- oncology	86	17.4
	NICU	6	1.2
	Neurology- Neurosurgery	3	0.6
	Psychology	7	1.4
	Other	171	34.7
Do you have working experience in the field of PC?	Yes	124	25.2
	No	369	74.8
Is receiving formal education such as participating in workshops and attending lectures or courses necessary for providing PC?	Yes	449	89.7
	No	51	10.3
Do you need to take a PC course?	Yes	449	89.7
	No	51	10.3

Table 2. Descriptive Characteristics of Attitudes towards and Knowledge of PC

Variables	Subscales	Mean	SD	Minimum	Maximum
Attitudes towards PC	Total score of Attitudes	142.03	11.35	99	172
	principles of PC	52.68	3.95	38	61
	patient's autonomy	34.73	4.65	22	45
	end-of-life care	29.38	3.64	19	43
	family participation in PC	25.22	3.27	9	30
Knowledge of PC	Total score of knowledge	19.47	2.62	10	26
	Physical Symptom management	6.29	1.59	2	10
	Pain management	5.24	1.27	2	9
	Psychological symptom management	4.30	0.81	1	6
	General concept	3.62	1.18	0	5

age range of 51-60 years, female gender, postgraduate education, working in hematology, pediatrics and other wards, the need for formal education in the field of PC and the need to take PC course.

According to regression coefficients, the mean score of attitude has a significant relationship with the age range of 41-60 years, female gender, postgraduate education, being a fellowship, job, working in Cardiac Care Unit (CCU), work experience in the field of PC, the need for formal education in the field PC and the need to take PC course.

According to the regression coefficients between the mean scores of knowledge and attitude (P-value = 0.001, b = 1.304), it can be said that knowledge is a good predictor of attitude and affects it. The coefficient of determination (R2) was reported to be 0.091, indicating that 9.1% of the variations in the mean score of attitude towards PC is accounted for by the knowledge.

Discussion

The aim of this study was to investigate caregivers' knowledge of and attitudes towards PC in Iran. Based on the results, the participants' attitude toward PC was reported to be moderate, where attitude towards the principles of PC had the highest, and attitude towards family participation, the lowest scores, which is consistent with some studies (Kim et al., 2020; Zeru et al., 2020). In addition, examining the items with the highest and the lowest scores showed the existing gap seems to be mainly a result of the insufficient knowledge (Fauziningtyas R 2020).

In the subscale attitude towards the principles of PC,

Table 3. Percentages of Highest and Lowest Scores of Items of Attitude and Knowledge Questionnaires

Variables	Subscales	Items with highest score	Percentage	Items with lowest score	Percentage
Attitudes towards PC	Principles of PC	One of the advantages of palliative care is improving the quality of life in patients and their families.	97.8	PC is different from conventional and traditional care.	3.6
	Patient's autonomy	The patient should be allowed to participate in choosing treatment.	91.1	In case patients want to be informed, it is good to estimate for them how long they are likely to live.	20.3
	End-of-life care	Having religious beliefs similar to the patient's improves the care provision process.	81.81	In most cases, when the patient is dying, the family should be informed instead of the patient.	16.1
	Family participation in PC	Skills in speaking compassionately about death to a dying patient or a patient's family should be developed and refined.	93.5	Providing care for the patient's family should continue in the time of grief and mourning.	78.1
Variables	Subscales	Most correct answers	Percentage	Most incorrect answers	Percentage
Knowledge of PC	Physical Symptom management	Anticholinergic drugs are effective in reducing respiratory discharge in patients at the end-of-life stage.	84.4	Morphine is effective in controlling shortness of breath.	69.2
	Pain management	People taking opioids should use laxatives.	83.2	While using morphine for long-term pain management, drug addiction needs to be taken seriously.	81.7
	Psychological symptom management	When delivering bad news to the patient, his/her concerns and perception of the disease should be asked.	92.1	Information should not be given to the patient or his/her family for it may increase their anxiety.	90.9
	General concept	Communication skills can be learned.	93.5	PC is the care terminated at the final stage of the disease.	35.7

Table 4. Result of Univariate Regression between Demographic and Professional Characteristics and Total Score of Attitude and Knowledge

Outcomes	Total score of knowledge					Total score Attitude				
Parameter	Beta	SE	95% CI for Beta	t	P	Beta	SE	95% CI for Beta	t	P
Age										
20-30	Ref	-		-	-	Ref	-		-	-
31-40	0.46	0.31	[-0.16, 1.08]	1.46	0.145	2.23	1.38	[-0.47,4.95]	1.62	0.106
41-50	0.55	0.33	[-0.11, 1.22]	1.64	0.103	2.99	1.47	[0.09,5.89]	2.03	0.043
51-60	1.73	0.51	[0.72, 2.74]	3.39	0.001	4.75	2.22	[0.37, 9.12]	2.13	0.033
61<	1.35	1.52	[-1.64, 4.35]	0.89	0.375	5.84	6.63	[-7.19, 18.89]	0.88	0.379
Gender										
Male	Ref	-	-	-	-	Ref	-	-	-	-
Female	0.87	0.34	[0.20, 1.54]	2.56	0.011	5.2	1.46	[2.32,8.08]	3.55	0.001
Educational status										
Bachelor	Ref		-	-	-	Ref	-	-	-	-
Master of sciences	0.75	0.27	[0.20, 1.30]	2.71	0.007	5.84	1.16	[3.55,8.13]	5.02	0.001
Medical Doctor	-1.05	1.16	[-3.34, 1.24]	-0.9	0.37	-5.34	4.86	[-14.91, 4.21]	-1.1	0.272
PhD	1.13	0.58	[-0.01, 2.27]	1.94	0.053	12.28	2.42	[7.51, 17.05]	5.06	0.001
Fellowship	4.75	2.6	[-0.36, 9.86]	1.83	0.068	31.85	10.82	[10.58, 53.11]	2.94	0.003
Job										
General Practitioner	Ref	-	-	-	-	Ref	-	-	-	-
Oncologist	2.66	3.03	[-3.29, 8.63]	0.88	0.38	24.66	12.54	[0.02, 49.31]	1.97	0.05
Nurse	2.12	1.52	[-0.86, 5.12]	1.4	0.163	21.17	6.29	[8.81, 33.54]	3.37	0.001
Faculty member	2.45	1.6	[-0.70, 5.62]	1.53	0.127	35.08	6.65	[22.01, 48.15]	5.27	0.001
Other	2.23	1.59	[-0.89, 5.37]	1.4	0.162	20.59	6.59	[7.62, 33.56]	3.12	0.002
work experience										
>1	Ref	-	-	-	-	Ref	-	-	-	-
1-3	0.33	0.78	[-1.21, 1.88]	0.43	0.669	1.04	3.43	[-5.70, 7.79]	0.3	0.762
4-5	-1.18	0.77	[-2.71, 0.34]	-1.52	0.129	-2.59	3.39	[-9.26, 4.08]	-0.76	0.446
6-10	-0.65	0.68	[-1.99, 0.68]	-0.96	0.34	-0.69	2.97	[-6.53, 5.15]	-0.23	0.816
<10	0.2	0.64	[-1.06, 1.47]	0.31	0.755	1.89	2.81	[-3.63, 7.43]	0.67	0.501
Workplace section										
Internal ward	Ref	-	-	-	-	Ref	-	-	-	-
Surgery ward	1.01	0.78	[-0.52, 2.54]	1.3	0.195	0.28	3.32	[-6.24, 6.82]	0.09	0.931
Maternity ward	1.15	0.87	[-0.57,2.88]	1.31	0.19	-1.42	3.74	[-8.77, 5.92]	-0.38	0.704
Emergency	0.15	0.67	[-1.16, 1.48]	0.23	0.817	-3.7	2.86	[-9.34, 1.93]	-1.29	0.197
Pediatrics	2.09	1	[0.12, 4.05]	2.09	0.037	6.05	4.26	[-2.31, 14.42]	1.42	0.156
CCU	0.23	0.59	[-0.92, 1.39]	0.4	0.688	-8.3	2.51	[-13.25, 3.36]	-3.3	0.001
ICU	0.97	0.63	[-0.27, 2.22]	1.53	0.126	0.95	2.7	[-4.35, 6.26]	0.35	0.724
Hematology- oncology	1.57	0.57	[0.43, 2.71]	2.72	0.007	-0.86	2.46	[-5.70, 3.98]	-0.35	0.727
NICU	0.53	1.17	[-1.76, 2.84]	0.46	0.646	-2.5	4.98	[-12.30, 7.30]	-0.5	0.617
Neurology- Neurosurgery	2.87	1.57	[0.22, 5.97]	1.82	0.069	-2.5	6.71	[-15.69, 10.69]	-0.37	0.71
Psychology	0.1	1.1	[-2.05, 2.27]	0.1	0.921	-3.92	4.69	[-13.14, 5.28]	-0.84	0.403
Other	1.34	0.54	[0.27, 2.41]	2.47	0.014	0.27	2.31	[-4.27, 4.83]	-0.12	0.905
Work experience in PC										
Yes	Ref	-	-	-	-	Ref	-	-	-	-
No	-0.44	0.27		-1.64	0.102	-2.62	1.17	[-4.93,-0.32]	-2.24	0.026
Is receiving formal education such as participating in workshops and attending lectures or courses necessary for providing PC?										
Yes	Ref	-	-	-	-	Ref	-	-	-	-
No	-1.03	0.38		-2.67	0.008	-7.82	1.64	[-11.05, -4.59]	-4.76	0
Do you need to take a PC course?										
Yes	Ref	-	-	-	-	Ref	-	-	-	-
No	-0.85	0.38		-2.21	0.027	-6.77	1.65	[-10.02, -3.52]	-4.1	0

the item "One of the advantages of PC is improving the quality of life in patients and their families" obtained the highest. The results of Thakur et al.'s study showed that palliative care is very important on the early survival of patients with advanced stage cancer. The results of this study are in line with the findings of the current study, which shows the positive attitude of health care providers towards this advantage of palliative care (Thakur and Ghoshal, 2019). The item "PC is different from conventional and traditional care", the lowest score. In an Iranian study, more than half of the participants were unfamiliar with the definition of PC (Farmani et al., 2019). In Iran, PC faces many challenges including structural challenges such as the absence of a proper definition for PC services (Khoshnazar et al., 2016) and it seems that no appropriate attitude exists towards the principles and foundations of PC and its philosophy which requires infrastructure and improving the culture and explaining the basics and principles include its scope, definition and dimensions (Barasteh et al., 2021).

In the subscale attitude towards family participation in PC, the items "Skills in speaking compassionately about death to a dying patient or the patient's family should be developed and refined" and "Providing care for the patient's family should continue in the time of grief and mourning" received the highest and the lowest scores, respectively. Iranian nurses stated that not receiving EOL care trainings during their education years creates challenges in the beginning of and during their profession (Ghaljeh et al., 2016). Nurses have also emphasized the need to raise public awareness of EOL care for cancer patients (Iranmanesh et al., 2009) and to address the needs of the family during the patient's lifetime and after his/her death (Zarea et al., 2020). On the other hand, spiritual care and bereavement care are referred to as a major part of the needs of family caregivers of cancer patients, while no program is formulated to provide this type of service or its education in Iran (Pakseresht et al., 2018).

In this regard, in the subscale attitude towards the EOL Care, the items "Having religious beliefs similar to the patient's improves the care provision process" and "In most cases, when the patient is dying, it is the family who should be informed instead of the patient" obtained the highest and the lowest scores, respectively, indicating that EOL care is the most challenging subscale of PC in Iran which is strongly influenced by cultural and religious conditions and is closely related to ethical and legal issues (Banazadeh et al., 2015), where telling the truth and the type of provided care is effective (Aghaei et al., 2017). In addition, the role of many Iranian families in EOL decision making is prominent. In the Iranian culture, it is common to withhold the truth from the patient regarding the disease and death. In this case, the truth is only told to the patient's family, often upon family's request. This is based on the belief that telling the truth to the patient leads to despair and increases his/her suffering and discomfort (Rassouli et al., 2021).

In the subscale attitude towards patient autonomy, the item "The patient should be allowed to participate in choosing treatment" received the highest and the item "In case patients want to be informed, it is good to estimate for them how long they are likely to live" the lowest percentage. Given that in the Iranian health system, usually the patient and the family play no part in deciding whether to continue or withhold the treatment, a major challenge on this matter is the existence of conflict and disagreement between medical staff and patients' relatives. Ethical and legal challenges increase when the patient is willing to undergo these procedures, but the patient's relatives refuse to accept them (Mobasher et al., 2014).

Based on the results of the present study, caregivers have a moderate knowledge of PC. Most participants answered the general questions correctly, but their knowledge is not sufficient enough for answering more specific PC questions. While in the study by Kim et al in South Korea, nurses' knowledge of PC was reported to be poor (Kim et al., 2020) and so was the Iranian nurses' knowledge of PC (Paknejadi et al., 2019). Few studies have also reported moderate or favorable levels of PC knowledge (Yamamoto et al., 2015). These different results can be due to differences in the characteristics of the research population including profession, level of education, workplace ward and taking PC training courses (Cleary, 2020).

In regard with the participants' knowledge, the highest level of knowledge was associated with pain and physical symptom management, and the lowest, with the general concepts of PC, which is in line with the findings of similar studies in other countries (Al-Drees et al., 2019; Kim et al., 2020) There is a lot of evidence regarding the inadequacy of PC training programs in various medical disciplines in Iran. Although, in general, there is no formal direct training under the title PC regarding the basics and principles of PC during general medicine and nursing undergraduate programs. However, pain and symptom management, regardless of its connection with the concept of PC, is one of the basic principles of care in nursing and medicine (Ebadinejad et al., 2021).

On the other hand, in the field of pain management, the item "People taking opioids usually use laxatives" had the highest percentage of correct answers, and the item "While using morphine for long-term pain management, drug addiction needs to be taken seriously", obtained the lowest percentage of incorrect answers. In addition, in the subscale physical symptom management, the item "Anticholinergic drugs are effective in reducing respiratory discharge in patients at the end-of-life stage" obtained the highest percentage of correct answers, while the item "Morphine is effective in controlling shortness of breath" had the highest percentage of incorrect answers. In general, it can be concluded that the items related to the prescription and use of drugs received the lowest scores. Opioid phobia, the laws restricting the prescription of drugs, insufficient knowledge and physicians and nurses' negative attitude toward the use of drugs to control pain and other symptoms are among the most important challenges in Iran (Barasteh et al., 2020). The fear of addiction as well as the culture of willingness to endure pain as a sign of divine mercy or the atonement for sins are among the other obstacles that can be eliminated by general and professional educations (Mojen, 2017).

In the subscale psychological symptom management,

the item "When delivering bad news to the patient, his/her concerns and perception of the disease should be asked," obtained the highest percentage of correct answers and the item "Information should not be given to the patient or his/her family for it may increase their anxiety," the highest percentage of incorrect answers. Breaking bad news is a complex process that requires a lot of skill to prevent adverse effects on the patient and relatives. Providing information about the disease is considered an undeniable and legal right of the patient in many societies. However, cultural issues affect the expectations, families' perceptions and the way of breaking bad news (Zheng et al., 2016), which should be considered in educational curriculums.

The results also show that as the level of education increases, caregivers' attitudes and knowledge regarding PC improves. In a systematic review, health care providers with a bachelor's degree had a higher level of PC knowledge compared to those with diploma certificates (Getie et al., 2021). In Iran, some nursing master's programs briefly present materials regarding the concepts of nursing care provision for the patient and family in critical and end-of-life stages, death, mourning and grief, pain, emotional support of the patient and family and legal issues (Ebadinejad et al., 2021). Education can affect people's mindset and, consequently, their behavior. Caregivers with higher levels of education are more inclined and motivated to behave better and have an optimal attitude, as a result of their broader knowledge and deeper insight, and provide better services (Ayed et al., 2015).

Working experience was another predictor of caregivers' knowledge of and attitude toward PC that has been confirmed in previous studies (Fauziningtyas R 2020; Getie et al., 2021). More working experience is associated with more experience which will eventually lead to an increased level of knowledge (Eshaghian-dorcheh et al., 2019). Working experience is a variable that indirectly affects one's attitude and performance (Al-Drees et al., 2019; Fauziningtyas R 2020).

In the present study, the workplace ward was also identified as a predictor of attitude and knowledge. Caregivers working in pediatric and hematology wards had a higher level of PC knowledge, and CCU staff had a more positive attitude towards PC. The findings of some studies also confirm these results (Kim et al., 2020; Zeru et al., 2020). This may be due to the fact that, PC was at first widely considered and developed in the field of care provision for patients with cancer or at the end-of-life stages, and training programs were offered to the caregivers who provided care for these patients (Kim et al., 2020). Therefore, it is necessary to develop training programs for all health care providers according to their workplace ward and the type of patients who are hospitalized in these wards and their need for PC.

In addition, the experience of providing PC is likely to lead to higher knowledge and a more positive attitude among caregivers. In this regard, some studies indicate that the experience of dealing with the patients in need of PC has a direct and positive impact on caregivers' knowledge of and attitude towards care providers (Aghaei et al., 2017; Al-Drees et al., 2019).

As expected, the level of knowledge was lower and the attitude more negative among those who reported the need for formal training in the field of PC and the need for taking PC courses, even though some studies stated that no correlation exists between PC knowledge and previous PC training (Al-Drees et al., 2019). PC training can increase the caregivers' knowledge (Turangan TW, 2017). Given that knowledge has a direct impact on attitude, it can be inferred that it may also affect individuals' attitude (Vu et al., 2019).

Due to pandemic conditions and the impossibility of being present in the research environment, the questionnaires were distributed online. Therefore, it was not possible to control the population ratio for each of genders and different groups of caregivers. Therefore, it is recommended to examine the knowledge of and attitude towards PC among other groups of health care providers in the treatment team, from both genders.

In conclusion, the present study showed that Iranian nurses and physicians have a moderate level of knowledge of PC and attitude towards it. The level of education, working experience and workplace correlated with the level of knowledge of and attitude towards PC. PC provision experience is also a predictor of caregivers' knowledge and attitude. The need for formal training and taking PC courses also explains the low level of knowledge of PC and the negative attitude towards it among caregivers. Therefore, it is necessary to take more measures in order to improve caregivers' knowledge and attitude by offering theoretical and clinical education and integrating the related topics into curriculums of different disciplines, and to focus on the effective and relevant factors.

Author Contribution Statement

L.KH, ME.A, H.A, S.B, S.B, A.ED, M.K, F.KH, E.K, A.SHF and M.R designed the study, E.K and M.R supervised and directed the study, L.KH, ME.A, H.A, S.B, S.B, A.ED, M.K and F.KH carried out the implementation, L.KH, H.A and S.B processed the experimental data, performed the analysis and drafted the manuscript, L.KH, H.A and S.B aided in designing the study and worked on the manuscript. All authors discussed the results, commented on the manuscript, and approved the final manuscript.

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Funding & Approval

This study was conducted as a research project by the vice-chancellor for research affairs of Shahid Beheshti University of Medical Sciences. It is not part of a thesis/dissertation.

Ethical Approval

This study was approved by the Research Ethics

Committee of Cancer Research Center- Shahid Beheshti University of Medical Sciences (IR.SBMU.CRC.REC.1400.018). Before study enrollment, informed written consent was obtained for all study participants. Their confidentiality was assured during the study.

All authors have reviewed and approved the submitted version of the manuscript.

Availability of data

Not applicable.

Conflicts of interest

The authors declare no conflict of interests.

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