BMC Health Services Research

RESEARCH

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Knowledge and perceptions of the roles of anesthesiologists as providers of healthcare services: toward better-educated patients

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Abstract

Background In modern healthcare systems, the scope of practice for anesthesiologists is expanding within and beyond the traditional perioperative care continuum. This study was conducted to assess the knowledge and perceptions of perioperative patients of the roles of anesthesiologists as providers of healthcare services in different Palestinian hospitals. The study also assessed associations between the patients' different demographic and clinical variables and their knowledge and perceptions about the roles of anesthesiologists.

Method This study was conducted using a cross-sectional design and a questionnaire among perioperative patients admitted for elective surgeries in five major public and private hospitals in the Nablus, Tulkarm, Jenin, and Salfit governorates of the West Bank of Palestine. The data were collected between September 2023 and December 2023.

Results Of the 500 patients invited, 411 patients completed the questionnaire, giving a response rate of 82.2%. The overall knowledge score of the patients about the roles of anesthesiologists was 59.4% (18.8%). The majority of the patients lacked awareness about the roles of anesthesiologists outside the operating room. There was a low positive correlation between the self-rated general health and overall knowledge score (Pearson's r = 0.17, *p*-value < 0.001). Similarly, knowledge scores were significantly higher for the patients who had a university education (*p*-value = < 0.001) and had a degree in one of the medical/health fields (*p*-value = < 0.001). On the other hand, the patients who lived in refugee camps (*p*-value = 0.048), had a blue-collar job (p-value = 0.005), and were scheduled to receive orthopedic surgeries (*p*-value = 0.035) had significantly lower knowledge scores.

Conclusion The findings of this study showed that perioperative patients in Palestine had inadequate knowledge about anesthesia and the roles of anesthesiologists, especially outside the operating room. Efforts should be made to improve the knowledge and perception of perioperative patients about anesthesia and the roles of anesthesiologists as providers of healthcare services. These efforts should be tailored to target uneducated patients, who have blue-collar jobs, live in refugee camps, and are scheduled to receive orthopedic surgeries.

Keywords Anesthesia, Anesthesiologists, Knowledge, Perception, Education

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Background

Since ether was passed over to the first patient in 1846, there has been a profound change in the roles of anesthesiologists [1]. Traditionally, the role of the anesthesiologist was mainly concerned with administering anesthetics and ensuring the safety of patients during surgery. Over the years, the roles of anesthesiologists have evolved to include performing measures that are aimed at minimizing the short- and long-term harms associated with surgery and anesthesia [1, 2]. In today's clinical practice, the anesthesiologist plays key roles not only in the operating room, but also in the intensive care unit, code team, preoperative clinics, and pain clinics [2]. In modern healthcare settings, anesthesiologists are highly qualified, licensed, and specialized groups of medical doctors who provide a variety of patient-centered healthcare services [2, 3]. For instance, anesthesiologists are increasingly engaged in preoperative patient assessment, stabilizing and managing the hemodynamics of intensive care unit patients, and management of patients with chronic pain [1, 2]. In perioperative settings, anesthesiologists are responsible for providing different healthcare services for surgical patients before, during, and after surgery. Moreover, anesthesiologists play a pivotal role in providing resuscitation and in the management of complications that may occur during or after the surgery [1].

Despite the significant advancements in the field of anesthesia and the expanding roles of anesthesiologists, patients in different healthcare systems lack awareness about anesthesia and understanding of the roles of anesthesiologists in and outside the operating room [4–7]. In Jordan, a study reported that patients lacked knowledge about anesthesia practice and had distorted images of the anesthesiologists, even though anesthesia was considered a major component of any surgical procedure [7]. Lack of knowledge and negative perceptions of anesthesia and the roles of anesthesiologists was reported to negatively affect the anesthesiologist-patient relationship. Similarly, patients in Saudi Arabia had several misconceptions about the qualifications and roles of anesthesiologists [8]. Other studies have reported that patients in high-income countries had higher knowledge about the roles of anesthesiologists compared to patients in middle- and low-income countries [4, 7, 9, 10].

It has been argued that a lack of knowledge about the roles and responsibilities of anesthesiologists can be associated with misconceptions among the patients, increased fear, anxiety, and negative behaviors toward anesthesia and anesthesiologists [4–7]. Fear, anxiety, and negative behaviors can be associated with an increased risk of perioperative complications, length of hospital stay, time to full recovery, deteriorated mental well-being, and quality of life of the patients [6, 11]. In addition, negative patient outcomes can be associated with increased burnout, anxiety, poor performance, and motivation among healthcare providers including anesthesiologists [12–14].

Given the important and evolving roles of anesthesiologists, there have been calls to increase public awareness about the importance and roles of anesthesiologists [1, 2, 5]. Little is known about knowledge and perceptions of the roles of anesthesiologists as providers of healthcare services among perioperative patients in different Palestinian hospitals. Therefore, this study was conducted to assess the knowledge and perceptions of perioperative patients of the roles of anesthesiologists as providers of healthcare services in different Palestinian hospitals. The study also assessed associations between the different demographic and clinical variables of the patients and their knowledge and perceptions about the roles of anesthesiologists.

Methods

Study design and settings

This study was conducted in a cross-sectional design. The study was conducted in five different major public and private hospitals in Nablus, Tulkarm, Jenin, and Salfit governorates of the West Bank of Palestine. One of the hospitals was the main teaching hospital in the West Bank of Palestine. The data were collected in the period between September 2023 and December 2023.

Population and sample size

The study population was all perioperative patients who were admitted for elective surgeries in the five major public and private hospitals. The sample size was calculated using an online sample size calculator (http://www.raosoft.com/) for a large population of more than 20,000, at a 95% confidence interval, and tolerating a 5% margin of error. The sample size needed for this study was 377 patients. To account for any potential refusals and dropouts, it was decided to invite 500 patients.

Perioperative patients were included when they were 18 years or older, admitted to one of the five major public and private hospitals for elective surgeries, and were able to provide written informed consent. On the other hand, the patients who were admitted for emergent surgeries, had a mental illness, altered consciousness, took medications that affected their decision-making ability, and those who had moderate or severe pain as measured using the visual analog pain scale (score > 4) were excluded from this study.

Study tool and data collection

The study tool used in this study was a questionnaire that was developed based on previous related studies

[6–8, 15]. The questionnaire consisted of three parts that contained a total of 39 items. The first part of the questionnaire contained 18 items and collected information relevant to age, sex, marital status, place of residence, educational level, whether the patient had a degree in one of the medical/health fields, and employment status of the patient. In addition, the patients were asked to express whether they were satisfied with their household income and social life. Moreover, the patients were asked to self-rate their general health on a scale of 0–100. In addition, the first part also collected information about the type of surgery, expected surgical risk level, past medical history, chronic medications, past surgical history, number of past surgical surgeries, fear of surgery, type of anesthesia, and whether the patient had a friend, family member, or relative who was an anesthesiologist. The second part of the questionnaire contained three multiple-choice items that assessed the knowledge and perceptions of the patients about the qualifications of anesthesiologists, their importance, and their relationship with the surgeons. The third part of the questionnaire contained 18 true or false items that were used to assess the knowledge and perceptions of the patients about the different perioperative (six intraoperative roles and three postoperative roles) and other roles of the anesthesiologists outside the operating room (three roles). Because all patients were native Arabs, the questionnaire was developed in Arabic language. The English version of the questionnaire is provided in Supplementary Table S1. The questionnaire was translated from Arabic to English (forward) and then from English to Arabic (backward) to ensure the accuracy of the translation.

A convenience sampling technique was used to recruit patients for this study. The patients who were scheduled for elective surgeries in the five different major public and private hospitals during the study period were potential study participants. The patients were screened against the inclusion and exclusion criteria and those who met the inclusion criteria were invited to provide written informed consent and participate in the study. The patients were interviewed by three researchers who were final-year medical students (Anwar Zahran, Firas Besharieh, and Yazan Hamdan). The researchers used the questionnaire to collect the data from the patients. Through their medical education and training, the researchers were trained to interview patients and collect their presentation, and past medical, surgical, and medication history. The patients were interviewed in privacy in the ward in which they were admitted and at least 12 h before their scheduled surgeries.

Validity and reliability

A pilot study was conducted among 25 patients who were not included in the larger study to ensure that the questionnaire was test–retest reliable and internally consistent. The pilot testing also ensured the readability, clarity, and comprehensibility of the questionnaire. The patients were asked to answer the questionnaire twice. Answers of the patients in both rounds were correlated and the Pearson's correlation coefficient was 0.96. This indicated an excellent test–retest reliability. The Cronbach's alpha was 0.72 which indicated acceptable internal consistency of the items.

Data analysis

The data collected in this study were entered into Microsoft Excel v.2016 for Windows and then were transferred for analysis into IBM SPSS v.22.0. Patients were awarded 1 point for each correct answer. Knowledge and perception scores were calculated as percentages of correct answers. Categorical nominal and ordinal data were expressed as frequencies (n) and percentages (%). Continuous data were expressed as mean with standard deviation (SD). Age was divided into two categories nearly around the mean. The data were compared using independent t-tests, one-way analysis of variance (ANOVA), and Pearson's correlations. A p-value of < 0.05 indicated statistical significance.

Ethical considerations

This study was conducted in adherence to the international guidelines and regulations followed in scientific research involving human subjects. Ethical approval was issued by the Institutional Review Board (IRB) of An-Najah National University (approval #: Med. July. 2023/29). In addition, the Office of Health Education of the Palestinian Ministry of Health approved the study in public hospitals. Moreover, additional approvals were obtained from the administrators of the private hospitals. All patients provided written informed consent before they took part in the study. The privacy of the patients and the confidentiality of the data were preserved throughout the study.

Results

Characteristics of the patients

Of the 500 patients invited, 411 patients completed the questionnaire, giving a response rate of 82.2%. The mean age of the patients was 38.8 (15.2) years. The mean self-rated satisfaction with the general health was 80.2 (18.1). In this study, the majority of the patients were younger than 40 years, female, married, lived in villages, had a school education, were unemployed, satisfied with their

household income and social life, had no past medical history, expected a moderate surgical risk, and feared surgery. On the other hand, the majority of the patients had past surgical history, received general anesthesia, and did not have a friend, family member, or relative who was an anesthesiologist. The detailed sociodemographic and clinical variables of the patients are shown in Table 1.

Knowledge of the patients about the roles of anesthesiologists

Of the patients, 323 (78.6%) knew that anesthesiologists were specialized doctors. On the other hand, 65 (15.8%) patients misconceived anesthesiologists as technicians. The rest of the patients believed that anesthesiologists were nurses, general practitioners, or surgeons. Although the majority (79.3%) of the patients were aware that both the anesthesiologists and the surgeons have equally important roles during the surgery, 58 (14.1%) patients believed that surgeons have more important roles. On the other hand, 306 (74.5%) patients believed that surgeons and anesthesiologists have separate roles from each other, however, 68 (16.5%) patients believed that anesthesiologists perform their roles under the instructions of surgeons. In this study, the majority of the patients lacked awareness about the roles of anesthesiologists in managing acute and chronic pain, managing patients in the intensive care unit, managing any complications that arise in the recovery room, evaluating the need for and administering fluids, and blood to the patient during surgery, performing cardiopulmonary resuscitation, monitoring the patient in the recovery room, and accompanying the patient to the recovery room following the surgery. Answers of the patients on the 18-knowledge items are shown in Table 2.

The overall knowledge score of the patients about the roles of anesthesiologists was 59.4% (18.8%). As shown in Table 2, the knowledge scores of the patients about the roles of anesthesiologists were in descending order as preoperative roles 78.1% (22.3%), intraoperative roles 64.3% (25.6%), postoperative roles 41.0% (39.2%), and roles outside operating room 31.0% (33.1%), respectively.

Associations between the sociodemographic and clinical characteristics of the patients with their knowledge about the roles of anesthesiologists

There was a low positive correlation between the self-rated general health and overall knowledge score (Pearson's $r = 0.17$, p-value < 0.001). Similarly, knowledge scores were significantly higher for the patients who had a university education (p-value $= < 0.001$) and had a degree in one of the medical/health fields (p-value $= < 0.001$). On the other hand, the patients who lived in refugee camps (p-value $= 0.048$), had a blue-collar job (p-value $= 0.005$), and were scheduled to receive orthopedic surgeries (p-value $= 0.035$) had significantly lower knowledge scores. Differences in knowledge scores of the patients are shown in Table 3.

Discussion

In modern healthcare systems, the scope of practice for anesthesiologists is expanding within and beyond the traditional perioperative care continuum [1–3]. This was the first study that assessed the knowledge and perceptions of perioperative patients about the roles of anesthesiologists as providers of healthcare services in different Palestinian hospitals. The findings of this study highlighted gaps in the knowledge of perioperative patients about the roles of anesthesiologists as providers of healthcare services. The study also identified associations between the sociodemographic and clinical variables of the patients with their knowledge and perceptions about the roles of anesthesiologists. The findings of this study might inform strategies and interventions to increase the awareness of the patients about the roles of anesthesiologists in providing healthcare services within and beyond the traditional perioperative care continuum. Increasing awareness of perioperative patients about the roles of anesthesiologists might improve the patients-anesthesiologists relationships, provision of healthcare services, and subsequently the outcomes of the patients.

The findings of this study showed that the perioperative patients included in this study had higher knowledge about the roles of anesthesiologists compared to those in nearby Jordan [7]. On the other hand, the patients who were included in this study had less knowledge compared to those in the UK and South Korea [4, 16]. The findings of this study were comparable to those reported in a previous study in Ethiopia [9]. Together, these findings indicate that perioperative patients in different healthcare systems hold variable awareness and perceptions about anesthesia and the roles of anesthesiologists.

In this study, the majority (78.6%) of the patients were aware that anesthesiologists were specialized doctors. Previous studies in different healthcare systems including South Korea, Ethiopia, and Jordan have reported lower awareness of patients about the fact that anesthesiologists are doctors [4, 7, 9]. These differences can be explained by differences in educational and health literacy levels of the patients included in these studies. Together, these findings might be a call to improve the awareness of the patients about anesthesia and the roles of anesthesiologists. Probably, adopting a more patient-centered care paradigm and promoting communication between the anesthesiologists and patients might improve the awareness of the patients about anesthesia and the roles of the anesthesiologists.

Table 1 Sociodemographic and clinical variables of the patients (*n* = *411*)

Variable	Category	n	%
Age (years)	< 40	252	61.3
	≥ 40	159	38.7
Sex	Male	152	37.0
	Female	259	63.0
Marital status	Single	74	18.0
	Married	325	79.1
	Widow	10	2.4
	Divorced	2	0.5
Place of residence	Village	237	57.7
	City	139	33.8
	Refugee camp	35	8.5
Educational level	School level	214	52.1
	University education	197	47.9
Had a degree in one of the medical/health fields	No	173	42.1
	Yes	24	5.8
Employment status	Unemployed	256	62.3
	A blue-collar job	40	9.7
	A white-collar job	115	28.0
Satisfied with household income	Not satisfied	81	19.7
	Satisfied	330	80.3
Satisfied with social life	Not satisfied	26	6.3
	Satisfied	385	93.7
Type of scheduled surgery	General surgery	132	32.1
	Gynecology/obstetrics	143	34.8
	Orthopedics	60	14.6
	Urology	26	6.3
	Others	50	12.2
Expected surgical risk	Mild	157	38.2
	Moderate	208	50.6
	High	46	11.2
Past medical history	No	319	77.6
	Yes	92	22.4
Chronic medications	No	316	76.9
	Yes	95	23.1
Past surgical history	No	114	27.7
	Yes	297	72.3
Number of previous surgeries	None	114	27.7
	Once	135	32.8
	More than once	162	39.4
Fear of surgery	No	178	43.3
	Yes	233	56.7
Type of anesthesia	Local anesthesia	35	11.8
	General anesthesia	238	80.1
	Both	24	8.1
Had a friend, family member, or relative who was an anesthesiologist	No	374	91.0
	Yes	37	9.0

Table 2 Answers of the patients on the roles of anesthesiologists

#	Role	Answer			
		Correct		Incorrect	
		n	%	n	%
	Preoperative, score: 78.1% (22.3%)				
1	Performing a preoperative assessment for the patients	337	82.0	74	18.0
2	Assessing the patient's suitability for surgery	330	80.3	81	19.7
3	Determining the appropriate duration of fasting before surgery	318	77.4	93	22.6
4	Providing education and counseling on anesthesia options	370	90.0	41	10.0
5	Providing education and counseling on potential complications of anesthesia options	307	74.7	104	25.3
6	Providing education and counseling on potential adverse effects of other medications that may be used	264	64.2	147	35.8
	Intraoperative, score: 64.3% (25.6%)				
1	Administering anesthetics to the patient	325	79.1	86	20.9
2	Administering analgesics to the patient	250	60.8	161	39.2
3	Monitoring the patient in the operating room throughout the surgery	259	63.0	152	37.0
4	Evaluating the need for and administering fluids and blood to the patient during surgery	167	40.6	244	59.4
5	Continuously monitoring the patient's stability throughout the surgery	285	69.3	126	30.7
6	Reversing anesthesia and safely waking the patient in the operating room at the end of the surgery	293	71.3	118	28.7
	Postoperative, score: 41.0% (39.2%)				
1	Accompanying the patient to the recovery room following the surgery	184	44.8	227	55.2
2	Monitoring the patient in the recovery room	174	42.3	237	57.7
3	Managing any complications that arise in the recovery room	147	35.8	264	64.2
	Outside the operating room, score: 31.0% (33.1%)				
1	Managing acute and chronic pain	71	17.3	340	82.7
2	Managing patients in the intensive care unit	138	33.6	273	66.4
3	Performing cardiopulmonary resuscitation	173	42.1	238	57.9

The findings of this study showed that the patients had higher knowledge about the preoperative and intraoperative roles of the anesthesiologists. On the other hand, the patients had less knowledge about the postoperative and the roles of the anesthesiologists outside the operating room. These findings were consistent with those that were reported in previous studies [4–7, 9]. These findings can be explained by the fact that perioperative patients often witness or interact with the anesthesiologists during the preoperative assessment and preparation and when the patients are admitted to the operating room. Postoperatively, patients often experience drowsiness and difficulty in remembering events or interactions with the anesthesiologists in the recovery room. This is often attributed to the effects of the anesthesia and residual effects of anesthetics on the level of consciousness and awareness of the roles of anesthesiologists within the recovery room.

The findings of this study showed that the patients were more aware of the intraoperative roles of anesthesiologists including administration of anesthetics, analgesics, and monitoring the patients. On the other hand, the roles of anesthesiologists in the management of hemodynamics and fluids, management of pain, and patients in the intensive care units were less recognized by the patients. These findings were also consistent with those that were reported in previous studies [4, 7, 9]. Once anesthesia is induced and patients become unconscious, they are unlikely to be aware of the monitoring and care services by the anesthesiologists. In addition, patients typically have more frequent interactions with surgeons compared to anesthesiologists.

In this study, the patients who had a university degree had higher knowledge about the roles of anesthesiologists. Similar findings were reported in studies that were conducted in Ethiopia, Pakistan, and Saudi Arabia [8, 9, 16, 17]. Compared to less educated patients, educated patients are more able to search, question, discuss, and understand health-related information [5, 11, 15, 16]. These findings were substantiated by the higher knowledge about the roles of the anesthesiologists among the patients who had a degree in one of the medical or health fields. Furthermore, the patients who lived in cities and those who had white-collar jobs had higher knowledge about the roles of anesthesiologists. Our findings were consistent with that were reported in Ethiopia [9]. These

Table 3 Associations between the sociodemographic and clinical characteristics of the patients with their knowledge about the roles of anesthesiologists

Variable	Category	Mean	SD	*p*-value
Age (years)	< 40	61.2	15.5	0.480
	≥ 40	62.4	18.6	
Sex	Male	61.4	19.0	0.626
	Female	62.3	16.5	
Marital status	Single	63.3	20.3	0.824
	Married	61.8	16.7	
	Widow	58.6	19.3	
	Divorced	59.5	16.8	
Place of residence	Village	61.8	17.9	**0.048**
	City	63.8	16.7	
	Refugee camp	55.6	15.9	
Educational level	School level	57.7	16.4	**< 0.001**
	University education	66.5	17.4	
Had a degree in one of the medical/health fields	No	63.9	16.4	**< 0.001**
	Yes	85.5	11.6	
Employment status	Unemployed	60.7	17.2	**0.005**
	A blue-collar job	57.6	16.6	
	A white-collar job	66.2	17.6	
Satisfied with household income	Not satisfied	61.8	19.5	0.925
	Satisfied	62.0	16.9	
Satisfied with social life	Not satisfied	56.8	21.5	0.118
	Satisfied	62.3	17.1	
Type of scheduled surgery	General surgery	63.1	18.7	**0.035**
	Gynecology/obstetrics	61.5	16.5	
	Orthopedics	56.3	17.4	
	Urology	67.4	16.6	
	Others	64.3	16.0	
Expected surgical risk	Mild	61.4	17.1	0.230
	Moderate	63.1	17.2	
	High	58.5	19.5	
Past medical history	No	62.7	17.4	0.130
	Yes	59.5	17.6	
Chronic medications	No	60.9	17.4	0.484
	Yes	62.3	17.5	
Past surgical history	No	60.0	18.3	0.157
	Yes	62.7	17.1	
Number of previous surgeries	None	60.0	18.3	0.565
	Once	62.1	17.5	
	More than once	63.2	16.7	
Fear of surgery	No	61.2	18.2	0.420
	Yes	62.6	16.8	
Type of anesthesia	Local anesthesia	61.2	13.3	0.809
	General anesthesia	62.8	17.8	
	Both	64.1	15.3	
Had a friend, family member, or relative who was an anesthesiologist	No	61.6	16.9	0.194
	Yes	65.5	21.8	

SD: standard deviation, statistically significant *p*-values are boldface

findings could be explained by higher affordability of healthcare services, access to healthcare facilities, and health information. In this study, the patients who were scheduled to receive urologic surgeries had higher knowledge compared to those who were scheduled to receive orthopedic surgeries. Compared to the patients who need orthopedic surgeries, patients with urologic health issues are often more stable, oriented, and engaged in decision-making. Probably, patients with urologic health issues engage in communication and decision-making with the healthcare providers including anesthesiologists. These findings were substantiated by the positive correlation between the self-rated general health and knowledge about the roles of anesthesiologists scores.

It has been argued that perioperative patients often desire to know more about anesthesia and the roles of anesthesiologists [1, 2, 4–7, 9–11, 15–17]. Therefore, efforts should be made to educate and improve the knowledge and perceptions of perioperative patients about anesthesia and the roles of anesthesiologists. Adopting patient-centered paradigms to care and increasing encounters and communications between the anesthesiologists and patients can improve patients' knowledge, perception, and satisfaction with anesthesia and other care services delivered by the anesthesiologists [17, 18]. A previous study found that a single postoperative visit from an anesthesiologist improved patient perception and satisfaction with both anesthesia and other care services [18].

Strengths and limitations of the study

The findings of this study should be interpreted after considering the following strengths. First, the sample size used in this study was comparatively large. Findings reported from studies with large sample sizes are more robust and reliable compared to those reported from studies with small sample sizes. Second, the patients included in this study were diverse in terms of sociodemographic and clinical variables. The patients were of both sexes, belonged to different age groups, and were scheduled to receive different surgical procedures. This should have improved the representation of the entire perioperative patient population. Third, this was a multicenter study. The study was conducted in five major public and private hospitals across the West Bank. Compared to single-center studies, findings reported from multicenter studies are more reliable and robust.

On the other hand, this study had some limitations. First, the study was conducted in a cross-sectional design. Cross-sectional studies are limited by the approach to establishing causality. Second, the data collected in this study were self-reported. Therefore, the data could be associated with recall and social desirability bias. Third, this study was observational and no interventions were conducted to improve the knowledge and perceptions of the patients about anesthesia and the roles of anesthesiologists. Future studies should consider investigating the best ways to improve the knowledge and perceptions of the patients about anesthesia and the roles of anesthesiologists. Fourth, variability in exposure of some patients to prior surgery and anesthesia was a potential confounding factor that should be accounted for. Moreover, a considerable number of female patietns who were scheduled to receive elective caesarean section and other obstetric surgeries were included. Therefore, the findings presented in this study should be interpreted with caution.

Conclusion

The findings of this study showed that perioperative patients in Palestine had inadequate knowledge about anesthesia and the roles of anesthesiologists, especially outside the operating room. Efforts should be made to improve the knowledge and perception of perioperative patients about anesthesia and the roles of anesthesiologists as providers of healthcare services. These efforts should be tailored to target uneducated patients, have blue-collar jobs, live in refugee camps, and are scheduled to receive orthopedic surgeries.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12913-024-12048-y.

Supplementary Material 1.

Acknowledgements

The authors would like to thank the study participants. An-Najah National University is acknowledged for making this study possible.

Authors' contributions

RS, MJ, and TA were involved in the conception and design of the work, analysis and interpretation of data, and drafting and final approval of the manuscript. AZ, FB, and YH were involved in the data acquisition, analysis, drafting of the work and final approval of the version to be published. All authors approved the final manuscript.

Funding

This study did not receive any specific funding.

Data availability

All data analyzed in this study were included in the manuscript or as supplementary materials.

Declarations

Ethics approval and consent to participate

This study was conducted in adherence to the international guidelines and regulations followed in scientific research involving human subjects. Ethical approval was issued by the Institutional Review Board (IRB) of An-Najah National University (approval #: Med. July. 2023/29). In addition, the Office of Health Education of the Palestinian Ministry of Health approved the study in public hospitals. Moreover, additional approvals were obtained from the

administrators of the private hospitals. All patients provided written informed consent before they took part in the study. The privacy of the patients and the confidentiality of the data were preserved throughout the study.

Consent to publication
Not applicable.

Competing interests
The authors declare no competing interests.

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Received: 15 April 2024 Accepted: 3 December 2024
Published online: 18 December 2024

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