Information Asymmetry between Physicians and Patients Undergoing Laparoscopic Cholecystectomy: Analysis of Patients' Awareness Level

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Abstract

Background: Obtaining informed consent is essential before conducting a healthcare intervention. Primary reason for obtaining informed consent is to eliminate asymmetry information between the physicians and patients. The aim of this study was to determine the significance of information symmetry between physicians and patients undergoing laparoscopic cholecystectomy.

Methods: An analytical study was carried out in 2019. Moreover, the research population consisted of patients undergoing laparoscopic cholecystectomy. As for the data collection tool, a researcher-made questionnaire was introduced. The validity and reliability of this questionnaire was confirmed. Questionnaire had five sections and Cronbach's alpha of 0.85 was achieved. The data were then analyzed by SPSS Version: 18.0.

Results: A total of 96 patients participated in the study, where around 30% of them were male. Only 20.3% of patients specified that they were aware of possible complications of their treatment, of which 62% cited their physician as the main source of this information. On the other hand, 80% of patients were fully aware of the benefits of their treatment.

Conclusions: The information asymmetry between physicians and patients about the benefits and complications of treatments should be somehow eliminated and the crucial information about the chosen treatment plan or alternative courses of action should be fully provided to the patient by the attending physician or nurse.

Background

It is a well-known fact that obtaining informed consent is essential before conducting a healthcare intervention such as invasive procedures and high-risk treatments on a patient [1]. As an essential condition to obtain informed consent is to provide clear and complete information, where it is ensured that the subject adequately understands the information being provided [2].

Therefore, obtaining legal informed consent without providing adequate information may be considered as professional negligence and a breach of the duty of care owed to the patient [3]. Consequently, physicians and other healthcare professionals are bound to disclose all the necessary information regarding any medical intervention to the patients [4]. In other words, due to the existing information asymmetry between the physicians and their patients, one is obliged to provide the patient with adequate and accurate information regarding the medical procedure in order to obtain informed consent [5]. Furthermore, the primary reason for obtaining informed consent is to eliminate this very asymmetry information between the physicians and patients [6].

Information asymmetry refers to the inadequacy in a patient's awareness regarding his or her condition [7]. Although it is quite normal and logical to witness an information asymmetry between the physicians who have received years of highly specialized training and patients who have little to no information

about the medical procedures, it is the obligation of medical professionals to bridge this gap with daily efforts [8]. The benefits, short-term risks, possible long-term outcomes, and consequences of a proposed treatment plan; alternative courses of action and the respective prognosis in the event of choosing a treatment plan; and the costs of delaying treatment are among the crucial information that a patient should be informed before any intervention by physicians and care providers [1, 4].

Although significant advances have been made in obtaining informed consent in legal and medical matters, a large portion of problems and uncertainties remain at large, including patient's decision-making capacity, freedom to make voluntary informed decisions, and provide adequate information to the patient before an intervention [1]. Physicians may give little attention to obtaining informed consent or discussing different alternative courses of action based on a belief that patients can be agitated and concerned or fail to understand the information being provided to them [9]. As a result, a significant difference can be observed in terms of obtaining truly informed consent with respect to physicians and patients in a manner that patients are under the notion of being deprived of adequate information regarding medical intervention. Needless to say, this indicates a wide gap between theory and practice [6]. For instance, numerous studies have revealed the inadequacies in the provided information to patients for a well-informed treatment decision [10–13]. In a study by Jukić et al., 30.7% of physicians reported that they had personally informed patients in detail about their current medical condition and different treatment options, while only 11% of patients stated that they received detailed information regarding their medical condition [11]. In another study by Yasmine, a relatively significant portion of physicians (50%) reported that the possible complications of the current treatment plan were explained in detail to the patients, while only a small number of patients (18.5%) stated that they were aware of the complications of the treatment plan [14].

In developing countries, where education standards and literacy levels are comparably lower, information asymmetries are often observed between patients and healthcare professionals [15, 16]. Moreover, studies conducted in Iran revealed that patients receive limited information about their medical condition and various treatment plans [2, 17, 18]. A study in this country indicated that 84.4%, 87.4%, and 86% of patients were not informed about other treatment options, benefits of other treatment options, and complications of other treatment plans, respectively [18].

This information asymmetry in healthcare systems leads to severe inequality between patients and physicians and essentially puts the patient in the mercy and totally dependent on the physician and the medical options offered by them; therefore, medical courses of action are primarily set by physicians [1]. In the meantime, involving patients in their medical decision-making process can serve as a helpful mechanism to reduce information asymmetry and tip the scale back to a balance in the physician-patient relationship [19]. Thus, physicians should act as a highly responsible medical expert and a supporting agent seeking the patient's best interest [20].

Laparoscopic cholecystectomy is an accepted surgical procedure in the treatment of patients suffering from symptomatic gallstones and acute cholecystitis [21]. This procedure has several advantages

including reduced hospital stay, decreased postoperative pain, reduced risk of infection and incisional hernia, faster recovery, and less scarring compared to open surgery. Thus, these benefits have led to performing more than 90% of cholecystectomies laparoscopically in developed countries. However, this procedure possesses several drawbacks including bleeding and infection at the site of surgery, bile leakage, injury to bile duct and intestine, and gallstone spillage into the abdominal cavity due to the Surgeon's inability to have adequate visualization [22]. Since both open and laparoscopic cholecystectomy are routinely performed in Iran and no study has been carried out to investigate the significance of information asymmetry between physicians and patients undergoing cholecystectomy, this study aims to assess the level of awareness with respect to possible complications, benefits, alternative courses of action, and post-discharge follow-up of in patients undergoing laparoscopic cholecystectomy.

Methods

Study Design and Setting

An analytical study was carried out in this 2019 research. The research population consisted of patients undergoing laparoscopic cholecystectomy at Shahid Beheshti Hospital in Kashan. The Sample size was determined using the formula

$$n = \frac{(Z_{1-\alpha/2})^2 P(1-P)}{d^2},$$

where the reliability coefficient and d were estimated at 0.95 and 0.1, respectively. Thus, a sample size of 96 was deemed adequate to carry out this study after substituting values in the above formula.

Data Collection

The data were collected using two methods. Based on the first method, researchers visited the hospital, which had provided the patients with questionnaires at the time of discharge and then collected the completed questionnaires. As for the second method, patients, who had been discharged in less than two weeks, were followed up over the phone and the questionnaire was filled based on their answers. Moreover, the validity of the researcher-made questionnaire, as the primary data collection tool of this study, was confirmed by experts, including 3 health information managers and 2 general surgeons, while a Cronbach's alpha of 0.85 was achieved in terms of its reliability. The questionnaire had five sections, including demographic information, postoperative complications (9 items), the benefits of the operation (4 items), the extent of information provided to patients (6 items), and an open-ended question to determine the responsible party (the patient or the attending physician) for choosing this specific type of surgery and specify the primary reasons if the patient is, in fact, the one who formed the final decision. The items were designed as closed-ended yes-no questions, where the complications and benefits of the

surgical procedure and the main source of a patient's information (attending physician, the field of study, previous readings) regarding the surgical procedure were investigated.

Statistical Analysis

The obtained data were analyzed using SPSS 18.0 and the findings were reported via a frequency distribution table. Furthermore, Independent T-Test was employed to determine the correlation between the awareness score and the gender and field of study. Pearson correlation coefficient was utilized to determine the correlation between the age and the awareness score of patients in terms of complications and benefits of the surgical procedure. Spearman's correlation coefficient was used to determine the correlation between the education level and the awareness score of patients in terms of complications and benefits of the surgical procedure. Finally, the open-ended question at the end of the questionnaire was analyzed using the content analysis method, in which the frequency of responses served as the basis of prioritizing effective factors.

Ethical Considerations

This study was conducted following the guidelines of the Declaration of Helsinki and the 31 codes of the National Ethics Committee on Biomedical Research have been followed. The researchers were introduced to the relevant hospital by an official letter from the Research Vice Chancellor of the School of Paramedical Sciences at "XXX", and the data were collected based on the approval of the School Vice Chancellor for Research.

Results

The mean age of participating patients was 49.14 ± 13.69 years, where the minimum and maximum ages were 10 and 81 years, respectively. The demographic information of patients is shown in Table 1.

Table 1
Demographic information of patients undergoing laparoscopic
cholecystectomy

Variables		No.	Percentage
Sex	Male	28	29.2%
	Female	68	70.8%
	Total	96	100%
Education Level	Illiterate	7	7.3%
	High School	33	34.4%
	Diploma	30	31.2%
	Associate Degree	12	12.5%
	BSc	14	14.6%
	MSc and Over	-	-
	Total	96	100%
Education Field Type	Medical Sciences	7	26.9%
	Non-Medical Sciences	19	73.1%
	Total	26*	100%
* The field of study is only specified for patients with a college degree.			

Table 2 and Fig. 1 shows the level of awareness in patients with respect to the complications associated with laparoscopic cholecystectomy and their source of information. The mean awareness score in terms of complications in this surgery was measured at 2.7 ± 1.82 (a poor score) out a maximum score of 9. Moreover, the attending physician was regarded as the primary source of information in 35.8% of the cases with respect to the complications associated with this surgical procedure.

Table 2
Level of patients' awareness and their information sources about surgery complications

Item	Answer		Source of Information			
	Yes Frequency (%)	No Frequency (%)	Field of Study Frequency (%)	Personal Previous Readings Frequency (%)	Attending Physician Frequency (%)	
1 Injury to Bile Duct	20 (20.8)	76 (79.2)	3 (15)	12 (60)	3 (5)	
2 Bleeding During Operation	15 (15.6)	81 (84.4)	3 (20)	8 (53.3)	4 (26.7)	
3 Postoperative Bleeding	20 (20.8)	76 (79.2)	4 (20)	9 (45)	7 (35)	
4 Bile Leakage	6 (6.2)	90 (93.8)	3 (50)	2 (33.3)	1 (16.7)	
5 Gallstones in the Common Bile Duct	26 (27.1)	70 (72.9)	3 (11.5)	7 (26.9)	16 (61.5)	
6 Incisional Hernia	15 (15.6)	81 (84.4)	3 (20)	3 (20)	9 (60)	
7 Infection and Injury in Umbilical Area	15 (15.6)	81 (84.4)	3 (20)	5 (33.3)	7 (46.7)	
8 Postoperative Fever	40 (41.7)	56 (58.3)	3 (7.5)	31 (77.5)	6 (15)	
9 Bowel Obstruction	18 (18.8)	78 (81.2)	3 (16.7)	6 (33.3)	9 (50)	
Total	175 (20.3)	658 (79.7)	28 (16.2)	83 (48)	62 (35.8)	

Table 3 and Fig. 2 shows the level of patients' awareness in terms of the benefits associated with laparoscopic cholecystectomy. The mean awareness score in terms of the benefits associated with this surgery was measured at 3.19 ± 1.4 (an acceptable score) out a maximum score of 4. Furthermore, based on Table 3, the attending physician was regarded as the primary source of information in 58% of the cases with respect to the benefits associated with laparoscopic cholecystectomy.

Table 3

Level of patients' awareness in terms of the surgery benefits and their sources of information

Items	Answer		Source of Information		
	Yes Frequency (%)	No Frequency (%)	Field of Study Frequency (%)	Personal Previous Readings Frequency (%)	Attending Physician Frequency (%)
1 Faster Recovery	79 (82.3)	17 (17.7)	3 (3.08)	20 (25.3)	56 (70.9)
2 Decreased Postoperative Pain	81 (84.4)	15 (15.6)	3 (3.7)	21 (25.9)	57 (70.4)
3 Little or No Scarring	78 (81.2)	18 (18.8)	3 (3.8)	45 (57.7)	30 (38.5)
4 Reduced Hospital Length of Stay (LOS)	69 (71.9)	27 (28.1)	3 (4.3)	30 (43.5)	36 (52.2)
Total	307 (79.9)	77 (20.1)	12 (3.9)	116 (37.8)	179 (58.3)

Table 4

Extent of information provided by the attending physician to the patients

Item	Yes Frequency (%)	No Frequency (%)
1 Explaining About Other Methods of Cholecystectomy and Alternative Therapies	81 (84.4)	15 (15.6)
3 Explaining About Selected Method for Cholecystectomy	79 (82.3)	17 (17.7)
4 Explaining About How to Take Prescribed Medications	96 (100)	-
5 Explaining About Next Visits Time	89 (92.7)	7 (7.3)
6 Explaining About Postoperative Diet	85 (88.5)	11 (11.5)
7 Explaining About How to Deal with Potential Problems at Home, Such as Pain and Fever	27 (28.1)	69 (71.9)

Although 79.3% of patients indicated that the attending physician provided information regarding the surgical procedure, however, 72% of them stated that adequate information was not provided in terms of how to handle possible complications of the surgery after discharge.

Based on the Independent T-Test, no significant difference was observed in awareness scores between men and women in terms of the complications and benefits associated with laparoscopic cholecystectomy ($P > 0.05$).

The Independent T-Test revealed that a significant difference can be observed between the patients with a degree in medical sciences and the ones who lack such education in terms of the awareness scores of the complications associated with laparoscopic cholecystectomy ($P < 0.001$). Due to its definition, this test was only carried out for the patients holding a college degree.

Pearson correlation coefficient indicated that an inverse correlation is present between age and the patients' awareness score in terms of the complications associated with laparoscopic cholecystectomy ($P < 0.001$ and $r = -0.465$).

Pearson correlation coefficient estimated that an inverse correlation can be observed between age and the patients' awareness score in terms of the benefits associated with laparoscopic cholecystectomy ($P < 0.001$ and $r = -0.515$).

Spearman's correlation coefficient revealed that a direct correlation is present between the education level and the patients' awareness score in terms of the complications associated with laparoscopic cholecystectomy ($P < 0.001$ and $r = 0.680$).

Spearman's correlation coefficient showed that a direct correlation can be observed between education level and the patients' awareness score in terms of the benefits associated with laparoscopic cholecystectomy ($P < 0.001$ and $r = 0.559$).

Moreover, 15 patients (15.6%) reported that they, in fact, made the decision regarding undergoing laparoscopic cholecystectomy, while 81 of them (84.4%) considered their attending physician as the sole decision-maker in this matter. Also, the content analysis of responses to the open-ended question indicated that the primary reasons for choosing to undergo a laparoscopic cholecystectomy were less scarring after surgery (8 individuals out of 15), less pain after surgery (4 individuals), and faster recovery (3 individuals).

Discussion

The present study aimed to investigate the significance of information symmetry between the physicians and patients undergoing laparoscopic cholecystectomy and the results proposed that little to no significant information asymmetry was present in terms of the benefits associated with this surgical procedure, while the information is asymmetric in terms of its complications between the physicians and patients.

Correlation between demographic characteristics and the significance of information symmetry regarding the surgery

In the present study, a significant indirect correlation was observed between age and the patients' awareness in terms of the benefits and complications of the surgery. On the other hand, there was a

significant direct correlation between the patients' level of education and awareness in terms of the benefits and complications of undergoing laparoscopic cholecystectomy. In a 2015 study by Masoompour et al., a direct correlation was observed between the health literacy and education level of patients, while a significant indirect correlation was present between the health literacy and age, which are consistent with the results obtained in the present study [23]. These findings suggest that age and education level are expected to affect the health literacy in patients, change their awareness regarding their medical condition, and existing treatment plans. As a potential reason for this correlation, one can mention this notion that young and educated individuals are more capable of finding related books and surfing the Internet and Social media in order to increase their information regarding the benefits and complications of medical interventions. Thus, medical ethics dictate that the attending physicians spend more time eradicating any information asymmetry between themselves and senior or less-educated patients.

The significance of information symmetry regarding the complications of the surgery

In the present study, a poor mean score was obtained for the patients' awareness regarding the complications of the surgery. Moreover, previous studies revealed that patients often prefer not to be fully informed about the potential risks and complications of future surgeries, consequently, these studies suggest that providing information to a number of patients about the risks and complications of their surgery cause unnecessary stress and anxiety [24, 25].

In a 2016 study by Yasmine, a small portion of patients (18.5%) were aware of the complications associated with their treatment [14]. In another study, it was indicated that only 20% of patients were informed about the complications of their treatment [26]. Furthermore, Oostendrop et al. revealed that more than 95% of patients prefer to be informed about the complications of their treatment, while all physicians were fully aware of this specific desire at the same time [27]. Consequently, invoking unnecessary stress and anxiety in patients can be considered as the main reason which compels physicians not to fully inform the patients about the complications of a treatment plan or surgery. The findings of this study revealed that information asymmetry exists between the physicians and patients in terms of the complications associated with laparoscopic cholecystectomy. As a possible reason for this undesirable information asymmetry, since physicians are well aware of the outstanding benefits associated with laparoscopic surgeries compared to open surgeries, they tend to lead patients to undergo laparoscopic surgeries. Consequently, physicians prefer not to elaborate in detail about the complications of medical interventions due to the onset of avoidable anxiety and stress in patients.

In a study by Farzandipour et al., the level of awareness was evaluated in discharged patients with informed consent about the complications associated with their treatment. It was concluded that 34.2% of patients were unaware of the complications associated with their treatment plan [17]. The findings of that study are inconsistent with that of the present study. As a reason for this inconsistency, one can

mention the significant difference between the research populations used in the two studies. It is of note that in patients who voluntarily preferred to be discharged, physicians attempt to inform patients as much as possible about the possible complications of their treatment and provide patients with a wide range of information in order to prevent lawsuits.

The significance of information symmetry regarding the benefits of the surgery

In the present study, the mean score of patients' awareness in terms of the benefits of this surgery was estimated at an acceptable level. In a 2018 study by Chima, around 61% and 57% of patients were informed of the benefits and complications of their treatment, respectively [4]. Although in the present study, patients are more aware of the benefits and less informed of the complications associated with their treatment plans compared to that of the study conducted by Chima in 2018, however, patients were more informed of the benefits of their treatment plans in comparison with that of the complications of their treatment plans in both of these studies. This trend strongly supports the idea that physicians are more likely to elaborate on the benefits of a treatment plan compared to expressing the complications of medical interventions.

The significance of information symmetry regarding alternative therapies

In the present study, about 85% of patients were informed about the alternative therapies for laparoscopic cholecystectomy, which was considered a highly acceptable level of awareness. In a study by Chima, around 41% of patients were informed about alternative courses of action [4], given the fact that 81% of patients were informed about the alternative therapies for laparoscopic cholecystectomy in the present study, the findings of these studies are inconsistent. This can be attributed to the highly limited number of alternative therapies for laparoscopic cholecystectomy in the present study. Furthermore, patients had to choose one of the two available surgical procedures as the main treatment in this study, which results in only one alternative treatment plan. However, in the study carried out by Chima, a wide range of alternative therapies caused the patients to be less informed of other available therapies compared to that of the present study. Based on a study by Agu et al., more than two-thirds of patients, regardless of their field of study, prefer to form decisions about the type of treatment they receive [28]. Since a large portion of physicians consider the patients' right to choose their own treatment out of the presented courses of action, as the most important general ethical guideline to follow [29], thus, it seems crucial that physicians inform patients about alternative therapies so that patients can make an informed decision while considering the benefits and complications of each course of action. This is of utmost importance in terms of medical ethics.

The significance of information symmetry regarding post-discharge information

In the present study, about 80% of patients indicated that the attending physicians provided them with some information at the time of discharge, however, more than two-thirds of the patients stated that the attending physicians failed to adequately inform them about handling possible complications after discharge from hospital. In a 2001 study by Henderson and Zemike, 66% of patients reported that they received standard and adequate information about their pain relief options at home before discharge, while 90% of patients stated that they received adequate information at the time of discharge to deal with the complications of their treatment at home [30]. The results of that study are inconsistent with that of the present study and it can be attributed to the fact that in the present study, only about 28% of participating patients stated that they were provided with adequate information on how to handle possible complications at the time of discharge. As a reason for this inconsistency, one can mention the large difference between the healthcare infrastructures of the countries under review. In the study by Henderson and Zemike, it was stated that a qualified nurse in the relevant department provides the patient with adequate information on how to tackle possible complications at the time of discharge. In the hospital investigated in this study, specific instructions had been developed for nurses to give to patients at the time of discharge, however, for reasons including time-consuming training processes at the time of discharge, little attention is devoted to these processes and are not fully explained according to the patients' needs. Furthermore, in a study by Ahrens et al., it was shown that medication prescription for patients are not well-written at the time of discharge and are not fully documented in their discharge letters [31]. In yet another study, it was indicated that patients have several misconceptions about postoperative and at-home pain and its management. Thus, debunking these misconceptions requires supportive suggestions and follow-up of healthcare professionals [32]. Based on the above studies and the findings of the present research, it is recommended that the attending physician or a qualified nurse offers the necessary guidelines for pain management or other possible complications and provide complete answers to patients and their caregivers at the time of discharge in order to eradicate dangerous misconceptions. Moreover, only written instructions should be provided to the patients since oral exchanges can be easily misunderstood. These written instructions may include medication prescription, diets, lifestyle and necessary measures that should be taken in the event of a complication. Finally, these suggestions should be fully tailored to the specific characteristics of a patient. For instance, how information is provided to senior or less-educated patients should be different from how information is delivered to other patients and may require a longer period of time.

Conclusions

Information asymmetry can be regarded as one of the problems facing many healthcare systems. Although information asymmetry between physicians and patients has been somewhat relieved in terms of the benefits associated with various treatment plans, however, information asymmetry exists in terms of the complications associated with different treatment plans and information provided at the time of

discharge. Thus, just as the patients have an undeniable right to be informed about the benefits of a treatment plan by their physician, the complications of a treatment plan and alternative courses of action should be explained for them so that a well-informed decision can be made regarding a treatment plan. Medical ethics dictates that patients make informed decisions about their treatment plans, thus, although information on rare complications can be kept from a patient who might develop unnecessary anxiety or stress, patients should be fully informed about different treatment plans before any medical intervention and at-home guidelines at the time of discharge by the attending physicians and qualified nurses. Providing information at the time of discharge, including medication prescription and how to handle potential complications, can be paramount since it can reduce unnecessary visits due to the onset of a number of complications.

Declarations

Ethics approval and consent to participate

Researchers followed all the principles of ethics in research. This study was conducted following the guidelines of the Declaration of Helsinki and the 31 codes of the National Ethics Committee on Biomedical Research have been followed. The researchers were introduced to the relevant hospital by an official letter from the Research Vice Chancellor of the School of Paramedical Sciences in Kashan University of Medical Sciences, and the data were collected based on the approval of the Vice Chancellor for Research. In accordance to that no information about participants is provided in this paper, all patients and their attending physicians who participated in this study gave informed verbal consent to participate in this research. Because some patients may be illiterate, it was preferable to give them verbal consent. Clause 13 of the National Regulations of Research allows for verbal consent in such cases. However, the objectives of the study were first fully explained to all patients and they were allowed not to deliver the questionnaire if they did not wish to do after completion.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

HT made substantial contributions to the conception, drafting and design. FRJ, MSJ, HT, MTK participated in data collection and performed the statistical analysis. FRJ, MSJ and HT contributed to manuscript drafting, revision and approval and HT supervised the research group. The authors read and approved the final manuscript.

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Figures

Figure 1

Primary sources of information in terms of complications associated with laparoscopic cholecystectomy

Figure 2

Primary sources of information in terms of benefits associated with laparoscopic cholecystectomy In figure a, each column represents a surgical complication and in figure b, each column represents a surgical benefit. Each column has three colors: blue, orange and gray. Blue color indicates the percentage of patients who have been notified toward this complication by their physician. The orange and gray

colors represent the percentage of patients who considered the complication through their previous readings and field of study, respectively.