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Original Research Article

Informed consent for invasive procedures: A perspective from Saudi Arabia

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Abstract

Informed consent process is an important exercise yet many doctors are less concerned about it, leading to unsatisfied patients with lack of knowledge about their management plan. The aim of the study was to explore patients' satisfaction with, and their attitude toward informed consent process in a teaching hospital. The study population comprised patients admitted to various departments for invasive procedures. A total of 138 patients were involved in the study during a 3 months' period. Patients undergoing invasive procedures were surveyed using a previously validated questionnaire used in a previously published local study. The informed consent form was seen and signed by majority of patients (88.2%), while (11.8%) were signed by another person. Percentage of mean score of satisfaction of experience with the informed consent process was 53.38% ± 19.33%, indicating dissatisfaction with the experience. Out of the patients surveyed, (44.5%) told that their approval or signature for the informed consent was not routine while, (71.7%) were explained about the risk they may face. One-third (31.9%) of the patients reported that they were not informed about the alternative treatment options. With regards to the factors affecting the quality of informed consent, Regression analysis showed that whether consent was explained by the physician or not (t= 2.199, P= 0.030) is the only significant one. The overall process of consent process is of poor quality, with around half of the surveyed patients were not satisfied with the experience of informed consent process and wished if they were really involved in decision-making. A possible explanation is that health care providers adopt a paternalistic approach that does not easily involve patients in decision-making.

Keywords: Attitude, Informed Consent, Invasive Procedure, Patients, Knowledge, Saudi Arabia

INTRODUCTION

The patient–doctor relationship has traditionally been based on trust. Adequate information from the doctor will confirm this relationship and satisfies the judicial ethical and legal responsibilities of a physician. Informed consent is a process of providing patients with the necessary and realistic information in a way that they can comprehend and recall, and allows them voluntarily to make their own choice on treatment. Informed consent ensures the fundamental components of consent, namely, voluntarism, capacity, disclosure, understanding and decision taking (Lidz, 2006). It also minimizes the chances of legal actions against the physician.

Although informed consent process is an equally important exercise compared with others in health care

activities, yet many doctors show little concern about informed consent obtaining process, leading to unsatisfied patients who will be lacking knowledge about the management of their disease. There is still little research that addresses patients' experiences towards consent process. Ochieng et al. (2014) reported that consent was obtained in less than 50 % of the cases. Same study showed that a large number of consents were not obtained by the surgeon who operated on the patients (Ochieng et al., 2014). Similarly, a study from Pakistan stated that there was a predominant involvement of staff nurses in taking consent among elective surgery cases. They also found that in majority of cases, the consent was given by patients' attendants (Ashraf et al., 2014).

A systematic review covering a period from (1961–2006) included studies regarding informed consent process for surgery and clinical research. Regarding surgery, adequate overall understanding of the information given and of the associated risks with the surgery was shown in 6 of 21 (29%) and 5 of 14 (36%) studies providing relevant data, respectively. Satisfaction by the amount of the given information was shown in 7 of 12 (58%) studies involving surgery (Falagas et al., 2009). Additionally, a study conducted in Pakistan showed poor quality of patients' knowledge regarding surgical intervention especially anesthesia-related techniques and complications (Ashraf et al., 2014). In the same study, only 5.9% of patients said that they were provided information and knew about complications and risks of their proposed anesthesia. However, around 50 % of them were generally satisfied with the given information of the consent process (Jawaid et al., 2012). On the contrary, results from the Far East of Asia were different. Eighty-six percent of Korean patients who underwent gastrointestinal endoscopy were able to recall the procedure risks (Song et al., 2010). Moreover, (94.5%) of patients undergoing glaucoma surgeries were given adequate information about the risks and complications of the procedure in a study from Korea in 2010. However, they concluded that only a few were able to recall the information given to them (Kang et al., 2010). At the local level, a study conducted in Riyadh, revealed a poor quality regarding informed consent process as well as the information given on risks of invasive procedures and alternative treatment options (Abolfotouh and Adlan, 2012). It was generally observed that the quality of existing practice of informed consent is less than ideal and needs to be strengthened by educating both the patients and the physicians alike (Akkad et al., 2006), therefore, the aim of our study was to explore patients' satisfaction with, and their attitude toward informed consent process in a teaching hospital.

Setting

The study was conducted at King Khalid University Hospital, a large academic tertiary center in Riyadh, Saudi Arabia. It is an 800-bed facility with increasing capacity that comprises of all general and subspecialty medical and surgical services. The hospital provides primary, secondary care services for Saudi patients from Riyadh area. It also provides tertiary care services to all Saudi citizens on referral bases.

Study population

The study population comprised of patients admitted to various departments for invasive procedures at King Khalid University Hospital (General surgery, Obstetrics and Gynecology, Internal Medicine and Cardiology) to assess the quality of obtaining their informed consent to the procedure.

Sampling Technique and Sample Size

Based on a 76% level of patients' attitude and satisfaction toward informed consent for invasive procedures (Abolfotouh and Adlan, 2012), 7% precision, and 95% confidence interval, the calculated sample size was 142 patients. Using a stratified sampling technique, patients who have signed their informed consent for the invasive procedure within 2 days were chosen to represent the different departments at KKUH. A total of 138 patients were involved in the study during a 3 months' period, with a 97 % response rate.

Survey procedure

Patients undergoing invasive procedures were surveyed using a previously validated questionnaire used by Abolfotouh and Adlan (2012). By using 12 statements that have "Yes", "No", or "Don't remember" answers, we were able to evaluate the overall experience of informed consent process. A scoring system that ranged from zero to twelve points was applied. One point was given to a "Yes" answer for a positive statement, and a "No" answer for a negative statement. The total score was summed for each patient, and the percent score was calculated. The reported experience with the information given on risks, alternative treatment options, and preferences about the decision-making process was also assessed using seven statements to which participants responded with "Yes", "No", or "Don't remember". A scoring system similar to the aforementioned system was applied and the total score was summed for each patient, and the percent score was calculated. The sum of scores of experience with the consent process and information given on risks was calculated for each patient to assess the overall quality of informed consent, and the percentage score was also

worked out. The attitude toward the informed consent procedure was assessed by 17 attitudinal statements. Participants responded to each statement with "Strongly agree", "Agree", "Neutral", "Disagree", or "Strongly disagree". The Likert five-point scale ranging from 17 to 85 points was used. The total score was given for each patient, and the percent score was computed. The patients were interviewed in different wards within 2 days after having signed their informed consent. The surveyors were medical students who were familiar with the questionnaire and the process of interviewing.

Ethical considerations

The study protocol (Application No E-15-1568) received ethical approval from the Institutional Review Board of King Saud University College of Medicine, Riyadh, Saudi Arabia.

RESULTS

Demographic and informed consent-related characteristics

A total of 138 patient participated in the study. Majority (73.9%) of the participants were High School graduates or higher, with no significant educational level difference. Regarding the specialty of the procedure to be performed, cardiology was first (30.4%), followed by general surgery (26.8%) obstetrics & gynecology (23.2%), and lastly internal medicine (19.6%) with statistically significant sex difference (X2 =38.245, df 3, P 0.000). The informed consent form was seen and signed by majority (88.2%) of patients themselves, whereas only (11.8%) were signed by another person, with no statistically significant sex difference. Regarding the person who attended the informed consent, doctors ranked first (67.2%) followed by nurses (24.8%). In the majority (82.6%) of the cases doctors explained the informed consent, few were explained by nurses (8.7%), and others (3.6%), with no statistically significant sex difference (X2= 2.906, df 3, P 0.406) was observed. (Table 1)

Patients' satisfaction regarding the experience of the informed consent process

Percentage of mean score of satisfaction of experience with the informed consent process was 53.38% ± 19.33%, which indicates dissatisfaction regarding the experience, with no significant sex difference. Out of the patients surveyed, (44.5%) told that their approval or signature for the informed consent was not routine. Regarding the information given, half of the patients reported that the information included in the informed consent was enough (50.4%) and (30.7%) were not sure. (76.6%) of the patients reported that there was enough time to read and understand the informed consent. Only (37%) of the patients surveyed revealed that they wished the treating physician had consulted them before a decision was made and 10% were not sure. Around half (44.2%) of the study sample thought that their own decision was not important because the doctor had already made a decision. (Table 2)

Patients' satisfaction with the provision of information to the patient about risks and alternative treatment options

The mean percent score of the reported experience was 48.86% ± 28.40%, indicating very low satisfaction rate. Out of the patients surveyed, (71.7%) were explained about the possible risks. One-third (32.9%) of the patients reported that they were not informed about the alternative treatment options, (35.5%) needed extra information and was not provided to them. Around half of the patients (47.8%) were able to remember the risks that were mentioned to them. (Table 2)

Attitude of patients toward the practice of informed consent

The percent mean attitude score was 69.7 ± 6.3 indicating positive attitude. Majority (60.9%) of patients mentioned that they "Strongly agree" with the statement that "Informed consent must be easy". A vast majority (92%) of the patients agreed and strongly agreed that alternative treatment options must be mentioned and explained to the patient. Regarding the statement, "It is important to have enough time to read the IC", (93.5%) of the participants agreed and strongly agreed to it. Meanwhile, only (9.4%) of the patients did not show any interest in participation of the decision-making process on the treatment ways.

Twenty-three percent of the patients, "Strongly agreed" that using medical terms scares the patients. In addition, (29%) of the patients "Agreed" that mentioning too much information led to intimidation of the patients. The data showed that majority (79%) of the patients "Strongly agreed/Agreed" with the importance of having a copy of the signed document. Only (39.1%) of the patients "Strongly agree and Agreed" that saying "no" or refusing the doctor decision would lead to lose their good relationship with the doctor. (30.4%) of the patients surveyed strongly agreed/ agreed that it would be rude to consult the opinion of

Table 1. Distribution of the study sample according to demographic and informed consent related characteristic

		Male		Female		Total	
		N	%	N	%	N	%
Education	Below high school	16	25.80%	20	26.30%	36	26.10%
	High school or above	46	74.20%	56	73.70%	102	73.90%
Specialty of procedure	General surgery	26	41.90%	11	14.50%	37	26.80%
	Cardiology	24	38.70%	18	23.70%	42	30.40%
	Internal Medicine	12	19.40%	15	19.70%	27	19.60%
	Obstetrics & Gynecology	0	0.00%	32	42.10%	32	23.20%
Did you sign the IC it by yourself	yes	59	96.70%	61	81.30%	120	88.20%
	no	2	3.30%	14	18.70%	16	11.80%
Who gave u the IC	doctor	41	67.20%	51	67.10%	92	67.20%
	nurse	16	26.20%	18	23.70%	34	24.80%
	other	4	6.60%	6	7.90%	10	7.30%
	no one	0	0.00%	1	1.30%	1	0.70%
Who explained the IC to you	doctor	52	83.90%	62	81.60%	114	82.60%
	nurse	7	11.30%	5	6.60%	12	8.70%
	other	1	1.60%	4	5.30%	5	3.60%
	no one	2	3.20%	5	6.60%	7	5.10%

Table 2. Patients' responses to experience and satisfaction with informed consent process and to the information given about the risks and alternative treatment options

	Yes		No		I don't know	
Satisfaction with IC process						
1. it's routine*	59	43.1%	61	44.5%	17	12.4%
2. info not enough*	26	19.0%	69	50.4%	42	30.7%
3. time not enough*	26	19.0%	105	76.6%	6	4.4%
4. IC not repeated*	43	31.4%	82	59.9%	12	8.8%
5. i had time to ask	107	78.1%	24	17.5%	6	4.4%
6. pt. is given a copy of IC	23	16.8%	107	78.1%	7	5.1%
7. info on paper is different from what i heard	7	5.2%	74	54.8%	54	40.0%
8. i agreed on the procedure & signed	125	90.6%	7	5.1%	6	4.3%
9. my decision is not important as the doctor chose the Tx plan*	61	44.2%	65	47.1%	12	8.7%
10. there was someone who checked my decision before I signed	57	41.3%	58	42.0%	23	16.7%
11. not educated about my Tx plan*	20	14.5%	109	79.0%	9	6.5%
12. wish i had been consulted by the doc*	51	37.0%	74	53.6%	13	9.4%
% mean score (standard deviation) 53.38% ± 19.33%						
Satisfaction with information given about the risks and alternative treatment options						
1. risks explained to me	99	71.7%	30	21.7%	9	6.5%
2. needed extra info and it was not given*	49	35.5%	74	53.6%	15	10.9%
3. i was given a plan to treat the risks	73	52.9%	53	38.4%	12	8.7%
4. I was given a contact when I needed it	33	24.1%	98	71.5%	6	4.4%
5. patient was able to recall the risks	66	47.8%	46	33.3%	26	18.8%
6. I was not informed about the alternative treatment options*	44	31.9%	82	59.4%	12	8.7%
7. The patient was able to recall the alternative treatment options.	45	32.6%	66	47.8%	27	19.6%
% mean score (standard deviation) 48.86% ±28.40%						
The overall satisfaction % mean score is 51.7 ±18.9						

Note: * score was calculated as a negative statement.

Table 3. Five-point Likert scale of the patients' attitude toward the practice of informed consent

Statement	Strongly agree (n, %)	Agree (n, %)	Not sure (n, %)	Disagree (n,%)	Strongly disagree (n,%)
1. The explanation must be easy and thorough	84 (60.9)	50 (36.2)	3(2.2)	1 (0.7)	
2. Using medical jargon intimidates patients*	32 (23.2)	46(33l3)	34(24.6)	22(15.9)	4(2.9)
3. Too much information scares patients*	32 (23.2)	40(29.0)	24(17.4)	31(22.5)	9(6.5)
4. All risks need to be explained to the patient	77(55.8)	38(27.5)	15(10.9)	7(5.1)	1(0.7)
5. It is important to repeat the explanation if the patient demands it	92 (66.7)	40(29.0)		4(2.9)	
6. All alternative treatment options must be explained	86(62.3)	41(29.7)	5(3.6)	5(3.6)	1(0.7)
7. It is important to know the plan for emergencies	83(60.1)	42(30.4)	7(5.1)	4(2.9)	1(0.7)
8. It is important to have someone to contact in case of emergencies	101(73.2)	31(22.5)	4(2.9)	2(1.4)	
9. It is important to have enough time to read the IC	64(46.4)	65(47.1)	3(2.2)	4(2.9)	2(1.4)
10. It is important to have answers to all my questions	83(60.1)	44(31.9)	6(4.3)	3(2.2)	
11. It is important to have a copy of the IC					
12. Patients should delegate the right of decision making to the doctor*	59(42.8) 39(28.3)	50(36.2) 58(42.0)	17(12.3) 28(20.3)	11(8.0) 12(8.7)	1(0.7) 1(0.7)
13. I want to choose my route of treatment					
14. If I say no, I might lose the good relationship with my doctor *	13(9.4) 20(14.5)	21(15.2) 34(24.6)	33(23.9) 35(25.4)	59(42.8) 38(27.5)	9(6.5) 11(8.0)
15. Saying no means I will not continue having the same great treatment*	24(17.4)	29(21.0)	48(34.8)	23(16.7)	12(8.7)
16. It is better to have a second opinion					
17. It is insulting to ask for a second opinion *	38(27.5)	62(44.9)	20(14.5)	11(8.0)	6(4.3)
% mean score (standard deviation) 69.7± 6.3	18(13.0)	24(17.4)	23(16.7)	50(36.2)	22(15.9)

Note: * score was calculated as a negative statement.

Table 4. Multiple regression analysis of the predictors of quality of informed consent for invasive procedures

Predictor	Coefficients		t	Sig.
	B	Std. Error		
1 (Constant)	8.375	.726	11.535	.000
Gender (Male=1)	-.047	.619	-.557	.579
Education (Secondary or more=1)	.078	.699	.925	.357
speciality of procedure	.151	.282	1.770	.079
Signed personally (yes=1)	.089	.942	1.025	.307
Asked to sign by physician (yes=1)	.050	.734	.517	.606
Explained by physician (yes=1)	1.757	.799	2.199	.030

Dependent variable: overall score of quality of informed consent

another doctor. (Table 3)

Overall quality of the informed consent process

The percent mean score of quality of the informed consent was 51.7% ± 18.9%, indicating poor quality, with no significant sex difference. Regarding the factors affecting the quality of informed consent, statistical analysis showed whether consent explained by the physician or not (t= 2.199, P= 0.030) is the only significant factor considered. (Table 4)

DISCUSSION

The doctrine of informed consent is well-rooted in the medical profession and is based on patient's right to respect of autonomy. To exercise this right, the patient is entitled to information sufficient to allow him to make an

informed decision. Despite all that, there are still problems with the process of informed consent. These are related mainly to the amount and quality of information provided and to other issues such as voluntariness, comprehension of the information, and many patients are not satisfied with the process of informed consent (Siddiqui et al., 2010).

This study was a cross-sectional survey of hospitalized patients who had signed the informed consent for the intervention within 2 days, and was conducted to explore patient's satisfaction with and attitudes towards informed consent.

The study shows that there was dissatisfaction among patients regarding the experience of informed consent process, their knowledge about the risks of the intervention and alternative management options, with an overall poor quality of informed consent process. Also, about half of the surveyed patient were not satisfied with the experience of informed consent process, as reflected by the finding that half of the surveyed patients reported that information included in the informed consent were insufficient, and that one third of them had no time to comprehend the information provided. Other studies have shown similar results (McKeague and Windsor, 2003; Faghanipour et al., 2014).

In our study, half of the patients wished to be involved in decision-making, a finding that was reported in another local study (Abolfotouh and Adlan, 2012). A possible explanation is that patients feel that their doctors were paternalistic, and would not easily allow them to be involved in the decision-making. They may also perceive themselves or been perceived by their doctors as incapable of decision making in health related issues. A recent survey of doctors' attitudes towards doctor-patient relationship in Singapore has shown that more than half of the doctors believe that patients are incapable of making rational decisions regarding their health care, or can make better choices than their doctors (Chan and Goh, 2000). Lack of involvement of patients in the decision-making process may question the voluntariness of the consent process. For the informed consent to be valid; it should be voluntary, with no coercion or pressure, and should be based on adequate disclosure and patients' comprehension.

Unfortunately, some health care professional perceive the consent process as only a signature of a consent form. Of course, this will influence their behavior and decision-making in relation to consent and patient choice. Perception of informed consent as a single incident, where a signature is sought after only a short conversation is a real problem. Effort should be exerted by the high authorities in the institution, the quality management department, and ethicist to change this perception. Using various approaches such as audits, awareness program, and other educational activities, with emphasis on the ethical and legal importance of the process may help to improve the process of taking informed consent.

The current study showed that a higher quality of informed consent was predicted when the physician was the one who explained the informed consent, this finding was also reported in another study (Lidz, 2006). This suggests that clinicians should explain the informed consent prior to the procedure day. Patients and their families trust physicians more than other members of the treating team, which puts more responsibility on physicians to explain to their patients, and in return the patients would give consent with greater satisfaction. We strongly recommend that the treating physicians should be more engaged in the process of informed consent and /or supervise the juniors during the process. We also recommend that this should not be, in any case, left for nurses, and other ancillary staff.

Comparable to a study conducted in Pakistan, where more than half of the patients believed that their decision was not important because the physician had already decided for them (Ashraf et al., 2014), about half of the patients in our study (44%) had a similar belief. Once again, this raises an ethical question whether patients are actually giving consents freely, or that they are influenced by the physicians. In our opinion, this area needs further exploration and more appropriately, through a qualitative study.

In agreement with Aboalfatooh's study (Abolfotouh and Adlan, 2012), more than half of the patients didn't wish to play a role in the decision of choosing the treatment plan and 44% trusted their doctor to choose the best approach. This raises the question of whether this finding is due to the paternalistic approach of doctors or due to the patient's desperation and fear, or the fact that the patients trust the doctor to a level that they do not argue with any of the decisions.

It is an observation of the experts in the field that the medical practice in Saudi Arabia is passing through a transition from a paternalistic approach in health care to a more patient-centered approach that values patient's autonomy, but we believe that this should be supported by empirical research. Hence, this finding is not surprising, and a sizeable proportion of Saudi patients and patient's families are still giving physicians more responsibility in decision-making. Further to this, it is also possible that patients find it difficult to be critical of their doctors, and this may affect their responses to some of the questions related to the quality of informed consent.

The finding that about 40% of the patients agreed that they should delegate the right of decision-making to the doctors, with a quarter of them not sure, along with the finding that the majority (72%), think that they might lose the good relationship with their doctors, may assert the complexity of decision-making, but overall it reflects the dominance of doctors in decision-making, and that shared decision-making is not well practiced.

We are cognizant of the limitations of our study, that include the difficulty in generalizing our results to the

practice in Saudi Arabia for the current study was restricted to selected specialties, and adults with capacity. The cross-sectional nature of the survey does not allow more inferences about the factors that determine the quality of informed consent. Despite that, our study refers to an important area, and will provide more insight about how to improve the process of informed consent.

CONCLUSION

In conclusion, the study shows that there is an overall poor quality of informed consent process. The decision-making process is more physician-centered and reflects, somehow, a paternalistic approach to informed consent process. To explore the conceptualization and the attitudes of patients and health care professionals to the informed consent in our society, a qualitative study is earnestly needed.

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REFERENCES

Abolfotouh MA, Adlan AA (2012). Quality of informed consent for invasive procedures in central Saudi Arabia. Int. J. General Medicine.;5:269-75.

Akkad A, Jackson C, Kenyon S, Dixon-Woods M, Taub N, Habiba M (2006). Patients' perceptions of written consent: questionnaire study. BMJ (Clinical research ed).;333(7567):528.

Ashraf B, Tasnim N, Saaiq M, Khaleeq Uz Z (2014). Informed consent for surgery: do our current practices conform to the accepted standards? Journal of the College of Physicians and Surgeons--Pakistan: JCPSP.;24(10):775-7.

Chan D, Goh LG (2000). The doctor-patient relationship: a survey of attitudes and practices of doctors in Singapore. Bioethics.;14(1):58-76.

Faghanipour S, Joolaee S, Sobhani M (2014). Surgical informed consent in Iran--how much is it informed? Nursing ethics.;21(3):314-22.

Falagas ME, Korbila IP, Giannopoulou KP, Kondilis BK, Peppas G (2009). Informed consent: how much and what do patients understand? American journal of surgery.;198(3):420-35.

Jawaid M, Farhan M, Masood Z, Husnain S (2012). Preoperative informed consent: is it truly informed? Iranian J. Public health.;41(9):25-30.

Kang KD, Abdul Majid AS, Kwag JH, Kim YD, Yim HB (2010). A prospective audit on the validity of written informed consent prior to glaucoma surgery: an Asian perspective. Graefe's archive for clinical and experimental ophthalmology = Albrecht von Graefes Archiv fur klinische und experimentelle Ophthalmologie.;248(5):687-701.

Lidz CW (2006). The therapeutic misconception and our models of competency and informed consent. Behavioral sciences and the law.;24(4):535-46.

McKeague M, Windsor J (2003). Patients' perception of the adequacy of informed consent: a pilot study of elective general surgical patients in Auckland. The New Zealand medical journal.;116(1170): U355.

Ochieng J IC, Buwembo W, Munabi I, Kiryowa H, Kitara D, Bukuluki P, Nzarubara G, Mwaka E (2014). Informed consent practices for surgical care at university teaching hospitals: a case in a low resource setting. BMC Med Ethics.;15(1):40.

Siddiqui FG, Shaikh JM, Memon MM (2010). An audit of informed consent in surgical patients at a university hospital. J. Ayub Medical College, Abbottabad: JAMC.;22(1):133-5.

Song JH, Yoon HS, Min BH, Lee JH, Kim YH, Chang DK, et al. (2010). Acceptance and Understanding of the Informed Consent Procedure Prior to Gastrointestinal Endoscopy by Patients: A Single-Center Experience in Korea. The Korean J. Int. Med. 25(1):36-43.