

Health Literacy in Lower Limb Orthopedic Trauma Patients in Riyadh Saudi Arabia

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ABSTRACT

BACKGROUND: Health literacy and knowledge is the persons' capabilities which allow them to understand basic health information to make their health decisions. Low understanding about the patients own condition is more associated with low medical knowledge and bad disease outcomes. Instructions should be given to patients for recovery to avoid complications.

AIM: To evaluate health knowledge of orthopedic trauma patients regarding their own condition in two level 1 Trauma centers in Riyadh, KSA and the association between health knowledge and patients demographics.

METHODS: This cross-sectional study included 102 participants

from 2 level 1 Trauma centers in Riyadh, in the period from the 1st of July 2018 to the 30th of September 2018. A survey was given to participants upon discharge after receiving discharge instruction.

RESULTS: 60.8% of the individuals had good knowledge. The mean rank score of males was 53.88, while for females it was 48.71, the highest mean rank was found in the age group 25-30 years old and it was 57.9, the highest mean rank regarding level of education was 56.93 for those with intermediate education and those with monthly income 5000 to 10000 SR had the highest score (64.2).

CONCLUSION: There was a high prevalence of health knowledge between orthopedic trauma patients regarding their own condition in Riyadh, KSA. Further multi center studies with a larger population should be conducted in order to assess and improve the health knowledge regarding the patients own condition among orthopedic patients and other specialties.

Key words: Health Literacy; Orthopedics Trauma; Saudi Arabia

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INTRODUCTION

Health literacy and knowledge became an area of research over the last decade^[1]. Health literacy refers to the persons' abilities which allow the person to process, obtain and understand basic health information to make their health decisions^[2], these abilities can be improved by educational programs, however, it can be decreased with increasing age^[3].

General health understanding is a poorly targeted factor that affecting public health^[4]. Those with very limited health understanding are more associated with low medical knowledge, increased hospitalization, bad control of chronic diseases, infrequent use of preventative services and bad disease outcomes^[5-7]. On the

contrary, those with adequate health literacy have more effective interactions with their physicians and they can make their appropriate treatment decisions^[8,9].

Health literacy of surgical procedures includes the awareness of patients about their conditions, interventions and post-operative treatment plans^[1]. The American College of Physicians Foundation has advertised informational cards that can be given to the patients to increase the health literacy level of patients^[10]. Patients should be informed about their conditions and the available treatment options, and after surgery, patients should be given instructions for recovery which are essential to avoid complications and to manage their own care^[4].

It was found in the US that 33% to 48% of individuals had inadequate health literacy^[11-14]. In the United Kingdom, it was found that one in five persons required to understand simple health information^[15], while in Canada 60% of adults were found to lack the capacity to understand, obtain health information and lack the ability to make appropriate health decisions^[16]. There were several studies reported that many patients had difficulties in comprehending their medications^[17-19], discharge instructions^[17-23], and diagnosis^[20-23].

It was reported that post-operative adverse events that result from a lack of information transfer was high as 30%^[24] and the lack in comprehension leads to low patient satisfaction and compliance^[25-27]. Physicians may increase the problem by overestimating patients' understanding of postsurgical treatment plans and discharge instructions^[17]. Calkins *et al*^[28] found that physicians thought that 95% of patients understood when to resume their normal activities, while only 58% of them said that they already understood that.

It was reported that in the orthopedic trauma clinic, the patients who received the text and pictorial intervention had higher mean score in the survey used increasing the patient comprehension can be obtained by using additional education modalities^[4]. Berkman *et al*^[29] reported that comprehension of the print material and health literacy was directly associated with health outcomes, where they found that patients who had low health literacy, identified less of their medications. There are few studies that reported about health literacy of patients, so this study aims to evaluate health literacy of orthopedic trauma patients after receiving a printed informational document at the time of discharge.

MATERIALS AND METHODS

Subjects

This cross-sectional study included 102 participants from two level 1 Trauma centers in Riyadh, the study was conducted in the period from the 1st of July 2018 to the 30th of September 2018. The participants included in this study were admitted with single isolated lower limb traumatic fractures and the patient's age selected to be 15 years and above. Patients with clinical dementia, psychiatric patients, and patients who were had an impaired judgment were excluded. The survey was given to participants upon discharge after receiving discharge instructions and an appointment included. The survey included 10 questions, 4 demographic questions and 6 questions regarding the patient's knowledge of his/her own condition.

Statistical analysis

Data were analyzed by using Statistical Package for Social Studies (SPSS 22; IBM Corp., New York, NY, USA). Chi-square test was used for categorical variables. The Mann-Whitney U test was used for the mean rank scoring. P-value <0.05 was considered statistically significant.

Table 1 Answers of participants about health knowledge and understanding questions regarding their own condition.

Question number	N (%)
Can you name what bone you broke?	
Yes	75 (73.5%)
NO	27 (26.5%)
Do you know how it was fixed?	
Yes	66(64.7%)
No	36(35.3%)
Do you know how much weight you can bear on your extremity?	
Yes	28(27.5%)
No	74(35.3%)
Do you know how long your bone will take to heal?	
Yes	76(74.5%)
No	26(25.5%)
Are you supposed to be on a medicine to prevent blood clots?	
Yes	33(32.4%)
No	69(67.6%)
Do you think that Your Doctor gave you enough information about your status?	
Yes	61(59.8%)
No	41(40.2%)

Table 2 Mean patient rank score of health knowledge and understanding of their condition.

Socio-demographics	Mean Rank	P-value
Gender		
Male	53.88	0.2
Female	48.71	
Age group		
< 18	37.5	
18-25	52.95	
26-30	57.9	0.5
31-35	48.32	
36-40	51.1	
> 40	51.67	
Level of education		
Intermediate or less	56.93	
Secondary	52.38	0.9
University	50.43	
Postgraduate	46	
Others	51.1	
Monthly income		
Less than or = 5000	46.5	
5000-10000	64.2	0.03
10000-15000	40.9	
15000-20000	58.75	
> 20000	52.38	

RESULTS

The survey was distributed to 130 patients, 9 patients denied to take the survey and 19 patients returned and incomplete questionnaire. The present study included 102 individuals with a response rate of 78.46%, 55 (53.9%) of them were males, while 47 (46.1%) were females. The most common age group was those with age range 18-25 representing 43.1%, followed by those with more than 40years old (17.6%), then those with age range 26-30 years and 31-35 years

representing 14.7% and 10.8% respectively and finally those with age less than 18 years and age of 36-40 years which represented 8.8% and 4.9% respectively as shown in figure 1. Most of participants 46 (45.1%) had university level of education, followed by those with secondary level 40(39.2%), while few percents 6.9%, 3.9% and 4.9% were with intermediate or less education level, postgraduate and others respectively as shown in figure 2. The percent of participants who receive monthly income ≤ 5000 SR was 50%, those who receive 5000-10000 SR was 20.6%, while individual with monthly income 10000 to 15000 SR, 15000 to 20000 SR and ≥ 20000 SR represented 9.8%, 11.8%, and 7.8% respectively as shown in figure 3. There were 6 questions in the survey to evaluate the knowledge of the patient's condition and treatment, the answers of participants about each question are shown in table 1 and figure 1.

Each question the patient answered with yes was equal to 16.66% of the total score, and each question answered with no was given 0% of the total score. Patients who answered 4 or more questions with YES which is were considered to have adequate health knowledge. The overall health knowledge and understanding of patients was evaluated and there were 62 (60.8%) of patients had adequate health knowledge, while 40 (39.2%) had and inadequate understanding regarding their condition. Scoring of questions showed that males had higher mean rank score (53.88) than female (48.71), those in the age range 25-30 years old had the highest mean rank score (57.9) between other age groups, Patients with intermediate education had the highest mean rank score (56.93) and the highest mean rank score was found for those with monthly income 5000-10000 SR (64.2), table 2.

Regarding presence and absence of health literacy, correlations were investigated with socio-demographics, table 3.

Table 3 Correlation of socio-demographics with presence and absence of health knowledge and understanding.

Socio-demographics	Health literacy presence				P-value
	Yes		No		
	N (%)	N (%)	N (%)	N (%)	
Gender					
Male	36	-58.1	19	-47.5	0.2
Female	26	-41.9	21	-52.5	
Age group					
< 18	3	-4.8	6	-15	
18-25	28	-45.2	16	-40	
26-30	11	-17.7	4	-10	0.7
31-35	6	-9.7	5	-12.5	
36-40	3	-4.8	2	-5	
> 40	11	-17.7	7	-17.5	
Level of education					
Intermediate or less	2	-3.2	5	-12.5	
Secondary	15	-24.2	25	-62.5	0.5
University	19	-30.6	27	-67.5	
Postgraduate	2	-3.2	2	-5	
Others	2	-3.2	3	-7.5	
Monthly income					
Less than or = 5000	26	-41.9	25	-62.5	
5000 - 10000	18	-29	3	-7.5	0.03
10000 - 15000	4	-6.5	6	-15	
15000 - 20000	9	-14.5	3	-7.5	
> 20000	5	-8.1	3	-7.5	

DISCUSSION

The survey of the present study involved 6 questions to investigate the health knowledge and understanding of the patient's own fracture, in question one the large majority of participants (73.5%) could name the broken bone, while in a previous study 48% only could correctly name their broken bones^[17].

In this study, a high percent of patients (64.7%) knew how it was fixed. In the third question, only 27.5% knew how much weight they could bear on their extremity, higher percent 54.8% in another study^[17] did not know their weight-bearing status after surgery. In question 4 most of the participants (74.5%) knew the time required for the bone to heal, this percent was very high when compared with the percent obtained from a previous study^[17], where 81% of patients didn't know the time needed for healing. In the fifth question low percent (32.4%) answered correctly regarding prevention of blood clot, while in the last questions, close percents for correct and wrong answers of the patients were obtained.

Our study concluded that a high percentage (60.8%) had an overall adequate health knowledge and understanding, while 39.2% of them didn't. In a Saudi study, it was found that one-half of Saudi population had a poor knowledge of health literacy^[30]. In the US, studies to estimate health understanding were established and it was reported that between 33% to 48% of Americans had inadequate health knowledge^[11-14].

In a study on the prevalence of musculoskeletal literacy, it was demonstrated that the prevalence of inadequate musculoskeletal literacy was 34%^[2]. It was demonstrated that one-third of patients at two urban public hospitals had inadequate health literacy^[31]. It was demonstrated that low understanding of a patient's general condition was correlated to older adults, low educational level, and people with

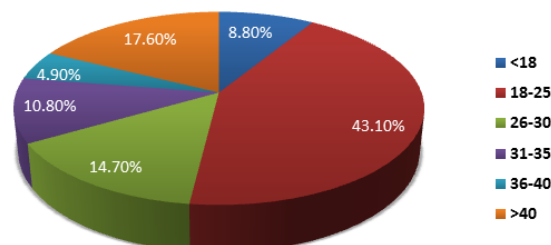


Figure 1 Age group of the involved participants.

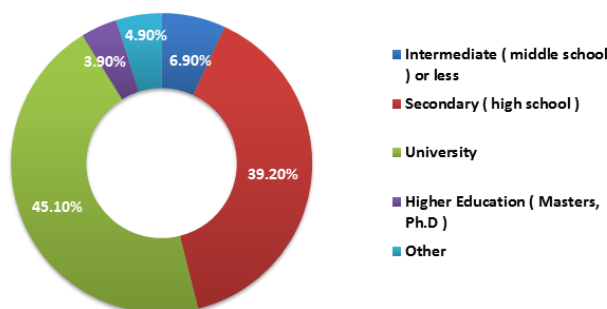


Figure 2 Level of Education of the involved Participants.

low-income levels^[32]. In the present study, the mean of the score for males were higher (53.88) than that of females (48.71), the opposite was found in a previous Saudi study^[30], where it was found that females scored higher than males. Regarding age, the highest score in this study was found for those in the age range 26-30 years old (57.9) than those older than 40 years old (51.67), however, no significances were found, this was in agreement with a Saudi study^[30].

Regarding educational level the highest score was found for

those with intermediate education (56.93), and no significant difference was found between different education levels and health knowledge scores, this means that education level didn't influence the comprehension of patients, this was in agreement with a previous study^[17], where it was reported that higher education was not significantly correlated to better performance on the questions. In our study, although there was a significant difference in health understanding regarding different monthly income, the low-income wasn't associated with low scores as it was previously stated^[32].

On the contrary to our findings, a Saudi study^[30] showed that there was a relationship between health literacy level and gender, age, and educational attainment. In the present study, by scoring and evaluating health literacy between patients, the only significance was found regarding monthly income of patients (P-value=0.03), while no significances were found regarding gender, age groups or level of education.

CONCLUSION

There was a high prevalence of health knowledge and understanding of ones general condition between patients, this, in turn, will affect positively on their health and making the correct decision for their treatment. Although there was no significant difference regarding health knowledge between different age groups, better health understanding was associated with younger age. The monthly income had an influence on the health literacy. Other studies with a larger population and a multi-center approach are recommended because there are few studies studied health literacy.

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REFERENCES

- Baker DW. The Meaning and the Measure of Health Literacy. *J GEN INTERN MED.* 2006; **21**: 878-883. [PMID: 16881951]; [PMCID: PMC1831571]; [DOI: 10.1111/j.1525-1497.2006.00540.x]
- Rosenbaum AJ, Dunkman A, Goldberg D, Uhl RL, Mulligan M. A Cross-Sectional Study of Musculoskeletal Health Literacy in Patients With Carpal Tunnel Syndrome. *HAND.* 2016; **11**(3): 330-335. [PMID: 27698636]; [PMCID: PMC5030862]; [DOI: 10.1177/1558944715627306]
- Baker DW, Gazmararian JA, Sudano J, Patterson M. The association between age and health literacy among elderly persons. *J Gerontol B Psychol Sci Soc Sci.* 2000; **55**: S368-74. [PMID: 11078114]; [DOI: 10.1093/geronb/55.6.s368]
- Tsahakis JM, Issar NM, Kadakia RJ, Archer KR, Barzyk T, Mir HR. Health Literacy in an Orthopaedic Trauma Patient Population: Improving Patient Comprehension with Informational Intervention. *J Orthop Trauma.* 2014; **28**: e75-e79. [PMID: 23899766]; [DOI: 10.1097/BOT.0b013e3182a66921]
- Johnson K and Weiss BD. How long does it take to assess literacy skills in clinical practice? *J Am Board Fam Med.* 2008; **21**(3): 211-214. [PMID: 18467532]; [DOI: 10.3122/jabfm.2008.03.070217]
- Nielsen-Bohlman L, Panzer AM and Kindig DA. Health Literacy: A Prescription to End Confusion. Washington, DC: The National Academies Press; 2004.
- Weiss BD. *Health Literacy: A Manual for Clinicians.* Chicago, IL: American Medical Association, American Medical Foundation; 2003.
- Basarudeen S, Sabharwal S. Assessing readability of patient education materials: current role in orthopaedics. *Clin Orthop*

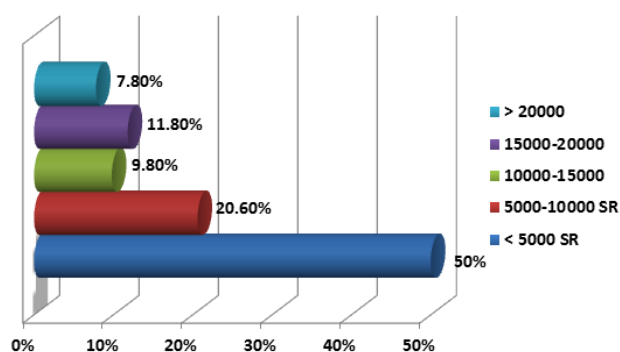


Figure 3 Monthly Income of the involved participants.

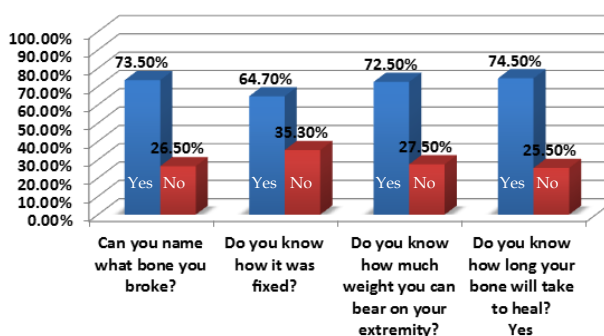


Figure 4 Participants Answers.

- Relat Res.* 2010; **468**(10): 2572-2580. [PMID: 20496023]; [PMCID: PMC3049622]; [DOI: 10.1007/s11999-010-1380-y]
- Pendlimari R, Holubar SD, Hassinger JP, Cima RR. Assessment of colon cancer literacy in screening colonoscopy patients: a validation study. *J Surg Res.* 2012; **175**(2): 221-226. [PMID: 21737097]; [DOI: 10.1016/j.jss.2011.04.036]
 - American College of Physicians. Downloadable Patient Health Care Information. Available at: <http://www.doctorsforadults.com/download.htm?dfa>. Accessed April 1, 2006.
 - Andrus MR, Roth MT. Health literacy: a review. *Pharmacotherapy.* 2002; **22**(3): 282-302. [PMID: 11898888]
 - Dewalt DA, Berkman ND, Sheridan S, Lohr K, Pignone MP. Literacy and health outcomes: a systematic review of the literature. *J Gen Inter Med.* 2004; **19**(12): 1228-1239. [PMID: 15610334]; [PMCID: PMC1492599]; [DOI: 10.1111/j.1525-1497.2004.40153.x]
 - Kutner M, Greenberg E, Jin Y and Paulsen C. The health literacy of America's adults: Results from the 2003 National Assessment of Adult Literacy. *NCES 2006-483.* <http://nces.ed.gov/pubs2006/2006483.pdf>. Published September, 2006. Accessed April 4, 2014.
 - Parker RM, Ratzan SC, Lurie N. Health literacy: a policy challenge for advancing high-quality health care. *Health Aff.* 2003; **22**(4): 147-153. [PMID: 12889762]
 - National Consumer Council. (2004) Health Literacy: being able to make the most of health. Written by Saranjit Sihota and Linda Lennard. London. 2004. (www.ncc.org.uk).
 - The International Adult Literacy and Skills Survey (IALSS). (2007) Health Literacy in Canada: Initial Results from the IALSS. (<http://www.ccl-cca.ca/NR/rdonlyres/CB3135D3-5493-45FAB870-1A3D3ABD6EC4/0/HealthLiteracyinCanada.pdf>).
 - Kadakia RJ, Tsahakis JM, Issar NM, *et al.* Health literacy in an orthopaedic trauma patient population: a cross sectional survey of patient comprehension. *J Orthop Trauma.* 2013; **27**(8): 467-471. [PMID: 23114414]; [DOI: 10.1097/BOT.0b013e3182793338]
 - Hwang SW, Tram CQ, Knarr N. The effect of illustrations on patient comprehension of medication instruction labels. *BMC Fam*

- Pract.* 2005; 6: 26. [PMID: 15960849]; [PMCID: PMC1177941]; [DOI: 10.1186/1471-2296-6-26]
19. Maniaci MJ, Heckman MG, Dawson NL. Functional health literacy and 20. understanding of medications at discharge. *Mayo Clin Proc.* 2008; 83: 554-558. [PMID: 18452685]; [DOI: 10.4065/83.5.554]
 21. Spandorfer JM, Karras DJ, Hughes LA, *et al.* Comprehension of discharge instructions by patients in an Urban Emergency Department. *Ann Emerg Med.* 1995; 25: 71-74. [PMID: 7802373]; [DOI: 10.1016/s0196-0644(95)70358-6]
 22. Makaryus AN, Friedman EA. Patient's understanding of their treatment plans and diagnosis at discharge. *Mayo Clin Proc.* 2005; 80: 991-994. [PMID: 16092576]; [DOI: 10.4065/80.8.991]
 23. Chugh A, Williams MV, Grigsby J, *et al.* Better Transitions: Improving comprehension of discharge instructions. *Front Health Serv Manage.* 2009; 25: 11-32. [PMID: 19382514]
 24. Bryant MD, Schoenberg ED, Johnson TV, *et al.* Multimedia version of a standard medical questionnaire improves patient understanding across all literacy levels. *J Urol.* 2008; 182: 1120-1125.
 25. Tsilimingras D and Bates DW. Addressing postdischarge adverse events: a neglected area. *Jt Comm J Qual Patient Saf.* 2008; 34: 85-97. [PMID: 18351193]
 26. Clarke C, Friedman SM, Shi K, *et al.* Emergency department discharge instructions comprehension and compliance study. *CJEM.* 2005; 7: 5-11. [PMID: 17355647]
 27. Clark PA, Drain M, Gesell SB, *et al.* Patient perceptions of quality in discharge instruction. *Patient Educ Couns.* 2005; 59: 56-68. [PMID: 16198219]; [DOI: 10.1016/j.pec.2004.09.010]
 28. Watt D, Wertzler W, Brannan G. Patient expectations of emergency department care: phase I—a focus group study. *CJEM.* 2005; 7: 12-16. [PMID: 17355648]
 29. Calkins DR, Davis RB, Reiley P, *et al.* Patient-physician communications at hospital discharge and patients' understanding of the postdischarge treatment plan. *Archiv Intern Med.* 1997; 157: 1026-1030.
 30. Berkman ND, Sheridan SL, Donahue KE, *et al.* Low health literacy and health outcomes: an updated systematic review. *Ann Intern Med.* 2011; 155: 97-107. [PMID: 21768583]; [DOI: 10.7326/0003-4819-155-2-201107190-00005]
 31. Abdel-latif MMM, Saad SY. Health literacy among Saudi population: a cross-sectional study. *Health Promotion International.* 2017: 1-11.
 32. Williams MV, Parker R, Baker DW, Parikh NS, Pitkin K, Coates WC, *et al.* Inadequate functional health literacy among patients at two public hospitals. *JAMA.* 1995; 274: 1677-1682. [PMID: 7474271]
 33. The National Center for Education Statistics (NCES), U.S. Department of Education, Institute of Education Sciences. (2006) *The Health Literacy of America's Adults: Results From the 2003 National Assessment of Adult Literacy.* Washington, DC.