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IN THE NAME OF ALLAH,
THE MOST GRACIOUS,
THE MOST MERCIFUL

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About the Journal

Majmaah Journal of Health Sciences

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The Majmaah Journal of Health Sciences shall be an international peer reviewed journal, which intends to serve researchers through prompt publication of significant advances, and to provide a forum for the reporting and discussion of news and issues concerning health sciences.

Mission

To lead the debate on health and to engage, inform, and stimulate the academicians, researchers, and other health professionals in ways that will improve outcomes for patients.

Objectives

To promote research & evidence based practice in health sciences, so that a firm scientific knowledge base is developed, from which more effective practice may be evolved.

To ensure that the results of the research are rapidly disseminated to the practicing clinicians and educators, in a fashion that conveys their significance for knowledge, culture and daily life.

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Editorial

From Editor's Desk…..

At the outset let me express my gratitude to our beloved Rector Dr.Khalid Bin Saad Al Meqrin and Vice Rector for Graduate Studies and Scientific Research Dr. Ahmad Alromaih for the trust endowed upon me.

Ever since human being were born diseases also appeared, but by the constant and earnest efforts of medicos and scientist, it were either controlled or eradicated. But the year 2020 passed with pandemic COVID-19 which produced global social and economic disruption. We stood helplessly by worldwide lockdowns and loss of millions of lives. Now the news of COVID-19 vaccine round the corner gives us lot of hope and energy for the New Year ahead.

MJHS is proud to bring forth its 1st issue of Vol 9: 2021 on time. The editorial team strives very hard to publish all issues on time; the journal office has witnessed a surge in the number of articles received. Articles related to the pandemic COVID-19 will be given priority and speedy processing. I express my sincere thanks to the international panel of experts and new team of associate editors for their efforts to improve the publication process of MJHS office and getting it indexed in reputable scientific platforms.

Authors who are submitting their research in MJHS are encouraged to enrich their scientific contributions by plagiarism checking and get their manuscripts professionally edited prior to submission; especially the authors for whom English is a second language. There are many editing services available that can help the authors improve the scientific and grammatical writing of their manuscripts. However, the language editing does not guarantee publication and any costs incurred are the sole responsibility of the author.

The editorial team would like to thank all authors, reviewers, readers for your continuous support for the success of MJHS. Wish you good luck for the year ahead 2021.

Dr.Khalid Mohammed Alabdulwahhab

Editor in Chief

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Letter to editor:

Herd Immunity could save the world from COVID-19!

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Sir, many strategies have been applied to break the spread and management of COVID 19 after declaring the pandemic of COVID 19. [1] These debates extended to the arguments of the economy and eventually about herd immunity. [2] This herd immunity is a strategy to allow the infection to spread into the population at a certain level, but at the same time protects the most vulnerable age group or with co-morbidities. [3] There are many issues pinned up with all kinds of strategies for controlling this deadly virus, and every strategy has its own consequences. Moreover, these consequences are indeed different in different countries depending upon their circumstances. Thus, it is stated precisely, there is no thumb rule, which can be applied to all countries straightforwardly. However, before initiating any strategy, there is a need to check the basic reproductive rate or number (R_0), or concisely the real-life effective reproductive number (R_t) for a given community. [4] Many articles have been written for these estimations and all calculations are available for all countries. Here it is needed to just overview these estimations for some developing countries where still a peak is awaited, and cases are increasing rapidly.

To pursue for the further discussion, we need to calculate the minimum percentage (Y) of population required to be immune for realizing herd immunity.[4] and for this estimation, we may use this formula [$Y= (R_0-1) / R0 X 100$]. These estimates may not be applicable to all countries and even seems higher in the whole world because those patients who have COVID-19 depict mild symptoms or could go undetected and improve in two to three weeks. This could be similar to the case of SARS-CoV-2 for instance and might describes why some individuals (perhaps a group of people recently recovered from the seasonal viral infection) may present

with milder or asymptomatic infections. [5] Therefore, all estimations are based on rough estimates of the basic reproductive (R_0). Hence, if we take the basic reproductive (R_0), 2 to 3 that is determined by different studies. [6] Then it would be roughly [Y= (2 – 1) / 2 × 100] = 50% of the population required to be immune to have herd immunity. Until now as to date almost 12% (10,000,00) cases have been reported and confirmed from the total 7.8 billion population of the world. Having said that, certainly it requires adequate finance, and other resources for the governing of the diseases. While only 12% affected cases are almost smashed the health systems and economy of even those countries, which claim that they are a huge economy ranging per capita income from 75000 dollars to 120,000 dollars, and have excellent health care system. Therefore, what would happen if 50% population means almost 4 billion people will be suffering to achieve the herd immunity, can we afford it?

Moreover, the story does not end here it will begin from here and make the situation worst, if only 10 to 20% of the affected 4 billion people may require admission and intensive care. So far, we cannot directly measure the economic burden due to utilization of health resources on focusing for the management of the COVID-19 patients. [7] The Latest literature showed that adjusting for patient and hospital characteristics, the mean incremental cost of mechanical ventilation in the intensive care unit (ICU) was 1,500 to 2000 dollars per day. Consequently, expected 10 to 20% out of 50% people of the world may need ICU admission and ventilators so the cost only for intensive cares could be in a billion dollars per day. [7] At last but not the least, we cannot calculate the cost of the loss of lives only in numbers during this pandemic. However, if we use analogy of number needed to treat (NNT) for our understanding and explicates it as number needed to save (NSS) for herd immunity, it outweigh the benefits of herd due to reaches to the level of unacceptable point. Consequently, if we consider the case fatality rate (CFR) of COVID-19 in between 0.25-3.0 percent of a country then estimated number of people who could potentially die from this deadly virus in that country, by the time community reaches to the herd immunity[3], could be adorable?

To conclude, leaving people in the hands of COVID-19 for getting maximum numbers of cases to achieve herd immunity is a catastrophe plan concerning losses of lives as well as economy. There are still so many questions left unanswered about COVID-19, in fact, it is not yet known how long this virus's survivor might have the required protection for herd immunity. How-

ever, it was mentioned earlier, that different countries have different circumstances. Nonetheless, I would strongly recommend World Health Organization should take a decision unanimously, with the representatives from all countries and ensures an effective lockdown for two weeks especially in those countries, which are on upsurge now days. Undeniably, it seems difficult to apply this strategy in some poor economic countries, but still a best solution of the problem. In addition, identify the hot spots, and then allow gradually relaxation in lockdown with strict application of all preventive measures, instead of waiting to develop 50% affected cases for herd immunity.

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Original article :

Safety and Feasibility of Laparoscopic Major Hepatectomy after Portal Vein Embolization

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Abstract

Background & Aims:
The operative safety and feasibility of laparoscopic major hepatectomy in patients after portal vein embolization is unknown, prompting our investigation of its safety and feasibility in patients at our center.

Methods:
Fifteen patients (male=13, female=2, with median age of 58 years), underwent laparoscopic major hepatectomy after portal vein embolization. Ten patients had hepatocellular carcinoma, two had combined hepatocellular carcinoma and cholangiocarcinoma, and 2 colorectal liver metastases, and 1 cholangiocarcinoma.

Results:
All patients were Child-Turcotte-Pugh score, 10 had liver fibrosis, and 10 had viral hepatitis. The median interval between portal vein embolization and laparoscopic major hepatectomy was 21 days. The median operative time was 324 min, estimated blood loss was 100 mL. White (2.5 mm) and blue (3.5 mm) cartridg-

الملخص

الخلفية و الاهداف:
خلصت بعض الدراسات إلى أمان و فعالية عمليات الإستئصال الكبرى لشرائح الكبد بالمنظار الجراحي، ولكن أمان و فعالية مثل هذه العمليات بعد إجراء إصمام الوريد البوابي، لم يتم توثيقها بعد، و تهدف هذه الدراسة إلى تقصي أمان و فعالية عمليات الإستئصال الكبرى لشرائح الكبد بالمنظار الجراحي بعد إجراء إصمام الوريد البوابي.

طريقة البحث:
تم اجراء ١٥ عملية إستئصال كبرى لشرائح الكبد بالمنظار الجراحي بعد إصمام الوريد البوابي في مركز سامسونغ الطبي بالعاصمة سيؤول بكوريا الجنوبية. ١٠ مرضى عانوا من سرطان الكبد، مريضين عانوا من سرطان مزدوج في الخلايا الكبدية والخلايا المرارية بالكبد، مريضين عانوا من نقائل سرطانية ذات منشأ قولوني، و مريض عانى من سرطان القنوات المرارية خارج الكبد.

النتائج:
كل المرضى كانوا مصنفين في المرحلة أ من تصنيف تشايلد لإعتلال وظائف الكبد، ١٠ مرضى عانوا من تليف في الكبد، ١٠ مرضى عانوا من إلتهابات فيروسية في الكبد.
وسيط مدة العملية كان ٣٢٤ دقيقة ، وسيط كمية الدم النازف المقدرة كان ١٠٠ مليليتر.

es were used in one patient each and Tri-Staple tan (2–3 mm) in 11 patients, and two patients required a combination of tan and purple cartridges (3–4 mm). There was one biliary leak and stricture after using a white cartridge, one transient hepatic insufficiency, and three minor complications. One patient died from a stroke on postoperative day 37. The mortality rate was 6.6% (1/15), and the morbidity rate was 33% (5/15).

Conclusion:

Laparoscopic major hepatectomy after portal vein embolization seems relatively safe and feasible. We advise against using a white cartridge and recommend a thicker cartridge for a more secure staple line.

Keywords:

feasibility, laparoscopic major hepatectomy, portal vein embolization, safety.

تم إستخدام خرطوش أبيض (٢.٥ مم) في مريض واحد، و خرطوش أزرق (٣.٥ مم) في مريض آخر، في حين تم إستخدام خرطوش ثلاثي أسمر (٢-٣ مم) في ١١ مريض، و تم إستخدام خرطوشين في مريض واحد (خرطوش أسمر، و خرطوش أرجواني بسمك ٣-٤ مم).

كان هناك تسريب مراري مع تضيق مراري في مريض واحد (خرطوش أبيض) ، بينما عانى مريض آخر من إعتلال حاد و قصور وظيفي حاد و لكن مؤقت وعابر في الكبد ، في حين عانى ثلاثة مرضى من مضاعفات صغرى.

توفي مريض واحد من جلطة دماغية في اليوم السابع و الثلاثين بعد العملية.

معدل الوفيات كان ٦.٦٪ (١/١٥)، و معدل المضاعفات كان ٣٣٪ (٥/١٥).

الإستنتاج:

خلصت الدراسة إلى أن عمليات الإستئصال الكبرى لشرائح الكبد بالمنظار الجراحي بعد إجراء إصمام الوريد البوابي هي فعالة بنفس فعالية الإجراء المفتوح، و كذلك هي آمنة نسبياً بمعدل وفاة و مضاعفات مقبول. و ينصح المؤلفين بعدم إستخدام الخرطوش الأبيض لقطع العنيق القليسوني بعد إصمام الوريد البوابي، وذلك للتسمك الشديد الذي يحدث في العنيق القليسوني بعد إصمام الوريد البوابي مما يحتاج خرطوشا أكثر سماكة.

الكلمات المفتاحية:

الفعالية، الآمان، إصمام الوريد البوابي،إستئصال شرائح الكبد بالمنظار الجراحي

Introduction

Primary liver cancer is the 7th most commonly diagnosed cancer type and second leading cause of death from cancer worldwide [1]. It is also the 4th and 6th most common malignancy in men and women, respectively, in South Korea and the 2nd leading cause of death in both sexes in South Korea, 80% of which are caused by hepatocellular carcinoma (HCC) [2]. Liver transplantation and liver resections are the only therapeutic strategies with curative intent and potential [3]; however, liver transplantation potential is limited by the inherent shortage in the donor pool worldwide[4], which makes liver resection the most commonly performed curative procedure for primary liver cancer [5]. The potential of major hepatectomy is limited by the risk of post-hepatectomy hepatic insufficiency [6], especially given that the most common form of primary liver cancer (HCC) is related with cirrhotic parenchy-

ma [7]. Although this morbidity has multiple risk factors, its single most important predictor is the volume of the future liver remnant (FLR) [8], limiting the resectability pool.

Selective portal vein embolization (PVE) is an effective adjunct to increasing the resectability pool, allowing major liver resection to be safely provided to a subset of patients with an inadequate FLR volume [9, 10]. The merits and advantages of the laparoscopic approach to laparoscopic major hepatectomy (LMH) have been well established [11–13]; however, the safety and feasibility of LMH after PVE is not known. Laparoscopic hepatectomy after PVE presents several unique technical challenges. First, a thicker pedicle with surrounding inflammation renders hilar dissection a challenging approach, with poor visibility due to diffuse and profuse oozing of blood[14]. Second, the security and safety of a pedicle transection with a stapler on top of coils can be potentially compromised. Thus, this study aimed to assess the safety and feasibility of LMH after PVE.

Materials and Methods

Patient information

Between May 2012 and September 2014, 15 patients underwent LMH after PVE at our center. After obtaining informed consent from patients and approval from the institutional review board of Samsung Medical Center (Seoul, Republic of Korea), we conducted a descriptive retrospective review of the patient's medical and surgical records for preoperative and postoperative details. Patient's liver function had been assessed with the Child-Turcotte-Pugh score and indocyanine green retention rate at 15 min. The inclusion criteria were as follows: patients of Korean descent, adult patients (>18 years old), patients with a diagnosis of liver cancer, patients who underwent LMH, and patients who underwent preoperative PVE. The exclusion criteria were as follows: withdrawal of consent and breach of surgeon's operative protocol. In this study, no patients were excluded.

Future liver remnant volumetric assessment

The FLR volume was assessed using contrast-enhanced computed tomography and calculated and expressed as a ratio of FLR to standard liver volume (FLR/SLV) and as a net increase of FLR (pre-PVE FLR minus post-PVE FLR divided by SLV) (Table1). The SLV, which is calculated using patients' height and weight, correlates better to the metabolic demands of patients than the total liver volume, which may be confounded by the liver status such as cirrhosis [15]. Moreover, it is a more ac-

curate comparison between pre-PVE FLR and post-PVE FLR when a constant SLV is used as a denominator rather than using the variable total liver volume, making comparisons less reliable [15, 16].

PVE and operative techniques

For PVE, we used a contralateral approach through the FLR pedicle, with an injection of Gelfoam into the distal half of the second-order branches and proximal deployment of coils. First-order branches as well as segmental portal veins were spared to segment IVa and IVb.

All operations were performed by a single attending surgeon, with 11 years of laparoscopic hepatectomy experience, using the temporary inflow control maneuver of the Glissonian pedicle technique. Briefly, a circumferential approach for extra-capsular and extra-fascial hilar dissection was performed, followed by temporary pedicle clamping using a bulldog clamp to control the inflow and visualize the ischemic demarcation line which was marked by cautery. Intraoperative ultrasonography was used to identify the middle hepatic vein and its tributaries. The parenchymal transection was started using Sonicision (Covidien, Mansfield, MA, USA) and bipolar forceps until two-thirds of the parenchymal dissection was achieved and the bifurcation of the Glissonean pedicle was fully exposed. A sling was wrapped around the right pedicle, the bulldog clamp was removed, and the stapler was applied to transect the pedicle while the sling was pulled in the opposite direction as a protective measure to avoid catastrophic injury to the remnant portal vein and bile duct. Tri-Staple tan cartridge (2–3 mm; Medtronic, Minneapolis, MN, USA) or a purple cartridge (3–4 mm) was used after estimating the thickness of the pedicle (Table 2). These procedures were performed in all patients, except for the first case, where a white cartridge (2.5 mm) [17] was used, and contralateral retraction of the remnant Glisson was not done. The cut surface was treated with local hemostatic agents, and a drain was inserted.

Results

Patient demographics are described in Table 1. The median age was 58
(range, 32–79) years. Of the 15 patients, 13 were men and two were women. The diagnoses were HCC (n=10), colorectal liver metastasis (n=2), combined HCC and cholangiocarcinoma (n=2), and cholangiocarcinoma (n=1). Twelve patients had been diagnosed with early-stage (I/II) disease, with one patient having stage IVa cholangiocarcinoma. The median number of tumor was 1 (range, 1–3), the median tumor size was 5 cm (range, 1.8–8

cm), and the median Child-Turcotte-Pugh score was 6 (range, 5–6). Ten patients had background fibrosis, of which one had cirrhosis. Ten patients had viral hepatitis (7 hepatitis B virus (HBV), two had hepatitis C virus (HCV), one had combined HBV/HCV infection).

The median initial FLR/SLV rate was 24.3% (range, 16.8%–28.8%), and the median post-PVE FLR volume rate was 42.6% (range, 33.7%–46.9%), with a median net increase of 71.3% (range, 38.8%–110.4%) over a median interval of 21 (range, 14–42) days (Table 1).

Eleven patients underwent laparoscopic right hepatectomy, with four undergoing laparoscopic extended right hepatectomy. The median operative time was 324 (range, 246–803) min, and the median estimated blood loss was 100 mL (range, 50–300 mL) (Table 2). All patients had a negative resection margin with a median margin of 1 cm (range, 0.1–5 cm). There were no conversions to open surgery, no intraoperative transfusions, and no operative mortality. One patient had postoperative intra-abdominal bleeding, which responded to transfusion therapy. There was one incidence of biliary leak and stricture that responded successfully to percutaneous transhepatic biliary drainage and endoscopic retrograde biliary drainage. Moreover, upper limb deep vein thrombosis (n=1), transient post-hepatectomy hepatic insufficiency (n=1), which was followed by full recovery, and surgical site infection after a combined colectomy (n=1) occurred. The median length of hospital stay was 9 (range, 5–37) days, and one patient died after a stroke on postoperative day 37 (Table 2).

Table 1. Patient Demographics

Patient	Age/sex	Comorbidity	Diagnosis	Tumor burden		CTP	ICG R15	Nontumoral liver status			SLV ml	FLR Pre-PVE %	FLR Post-PVE %	FLR Net increase %	PVE-Surgery Interval (days)
				no	Size cm			Fibrosis	Cirrhosis	CASH					
1	44/m		CCC-B/C	1	6.3	A5	10%	No	No	NA	1278	21%	44%	110%	28
2	58/f	TB	HCC-B	1	5	A6	17%	Septal	No	NA	996	27%	46%	71%	21
3	76/f	Nill	HCC-B	1	1.8	A6	10%	Septal	No	NA	982	20%	41%	110%	21
4	57m	Nill	CLM	1	6	A5	18%	No	No	No	1191	29%	47%	63%	28
5	50/m		CLM	3	3	A5	7%	No	No	No	1365	27%	44%	63%	14
6	57/m	DVT, PE, IHD, DM, HTN	HCC-B	1	3.8	A6	10%	Septal	No	NA	1376	23%	35%	52%	21
7	32/m	Nill	HCC-B	1	2	A5	10%	Septal	No	NA	1396	27%	39%	41%	14
8	78/m	DM, HTN	HCC-B	1	6.5	A6	9%	No	No	NA	1274	25%	43%	73%	21
9	65/m	DM, TB, HTN, HIV	CCC	1	8	A6	16%	Septal	No	NA	1341	28%	46%	62%	14
10	55/m	HTN, DM	HCC-B/ CCC	1	6	A6	70%	cirrhosis	Micronodular	NA	1211	24%	34%	39%	42
11	56/m	, HTN, TB	combined CCC/ HCC-B	1	3.5	A5	16%	Septal	No`	NA	1093	26%	44%	70%	21
12	68/m	HTN	HCC-NBNC	1	4.5	A5	8%	Septal	No	NA	1154	23%	42%	83%	14
13	79/m	DM, COPD	HCC-NBNC	1	12	A6	13%	No	No	NA	1147	17%	35%	105%	14
14	68/m	TB	HCC-C	1	5	A6	24%	Septal	No	NA	1181	19%	38%	102%	14
15	61/m	Nill	HCC-C	1	3.5	A6	17%	Septal	No	NA	1119	24%	43%	79%	14

B, hepatitis B virus; C, hepatitis C virus; CASH, chemotherapy-associated steatohepatitis; CCC, cholangiocarcinoma; CLM, colorectal liver metastasis; COPD, chronic obstructive pulmonary disease; CTP, Child-Turcotte-Pugh; DM, diabetes mellitus; DVT, deep vein thrombosis; F, female; FLR, future liver remnant; HCC, hepatocellular carcinoma; HIV, human immunodeficiency virus; HTN, hypertension; ICGR15, indocyanine green retention rate at 15 minutes; IHD, ischemic heart disease; M, male; NA, not applicable; NBNC, no hepatitis B or C virus; PE, pulmonary embolism; PVE, portal vein embolization, SLV, standard liver volume; TB, tuberculosis, NA Not applicable

Table 2. Perioperative variables

Patient	Procedure	Operative time mins	Pringle's (no)	Pringle's duration (mins)	EBL (ml)	Margin (cm)	Stapler color code	Complications			LOS (day)
								Type	Grade (CD)	Management	
1	eRH	803	3	45	< 300	1	White*	Postoperative bleeding	Ii	Conservatively Blood component therapy	37
								Bile leak, grade B	Iiia	PTBD/ ERPD	
2	RH	293	0		< 100	5.5	Tan†				9
3	eRH	324	0		< 100	0.5	Tan	Upper limb DVT	Ii	Anticoagulation	14
4	RH & RC	276	0		< 100	2	Tan	SSI: superficial incision	Ii	IV antibiotic/bedside drainage	25
								Organ space (thoracic empyema)	Iiia	IV antibiotics/ICD	
5	RH	363	1	8	< 100	1	Tan				9
6	RH	253	0		< 100	4	Tan				10
7	RH	266	0		< 100	1	Tan				8
8	RH	246	0		< 50	0.1	Tan				5
9	RH	332	2	30	< 300	2	Tan				8
10	RH	570	3	45	< 300	0.5	Tan	Post-hepatectomy liver insufficiency	Iva	Supportive ICU care	20
11	RH	272	1	15	< 50	5	Tan				10
12	RH	248	2	30	< 100	1.4	Tan				6
13	eRH	421	5	75	< 300	0.5	Tan, purple‡	Brain air embolism	V	Supportive ICU care	35
14	eRH	452	1	20	< 300	1	Tan, purple				7
15	RH	343	0		< 100	1.1	Blue #				7

CD, Clavien-Dindo Classification; DVT, deep vein thrombosis; ERBD, endoscopic retrograde biliary drainage; eRH, extended right hemihepatectomy; ICD, intercostal drainage tube; ICU, intensive care unit; IV, intravenous; PTBD, percutaneous transhepatic biliary drainage; RC, right hemicolectomy; RH, right hemihepatectomy; SSI, surgical site infection

* (2.5 mm) thickness

† (2–3 mm, Tri-Staple) thickness

‡ (3–4 mm, Tri-Staple) thickness

(3.5 mm) thickness

Discussion

In this case series, we investigated the safety and feasibility of LMH for this specific subpopulation of patients in our center. Fifteen patients underwent LMH post PVE, with a morbidity rate of 33%, and a mortality rate of 6.6%.

The laparoscopic approach to major hepatectomy is being increasingly adopted, with many technical challenges having now been overcome, establishing its safety and feasibility [18–20]. However, in patients

who undergo PVE, LMH poses a unique set of technical challenges related to dissection and transection of the ipsilateral Glissonean pedicle because the pedicle is thicker resulting from surrounding inflammation, which causes oozing of blood and poor visibility, and the security and safety of a pedicle transection with a stapler can be potentially compromised [14]. Thus, the safety and feasibility of LMH in this particular subpopulation remains under study. The first patient from the series had postoperative bleeding, bile leak, and stricture, reflecting a staple line failure. It's the author's opinion that the bleeding and biliary leak was probably caused by the inappropriate use of a thin white cartridge for a thick Glissonean pedicle found in patients with PVE, and that biliary stricture was probably due to not implementing the sling technique (pulling away towards the contralateral side during stapling for protection from potential involvement or narrowing of the remnant structure). These complications were taken into consideration for the rest of our patients, in which a thick Tri-Staple tan cartridge was used, and contralateral traction of the sling was applied, and staple line failure was not observed subsequently.

Only one patient experienced surgical site infection, most likely due to a simultaneous colectomy. The liver function recovered well except in a 55-year-old patient who had background cirrhosis with an indocyanine green retention rate of 70% before PVE (it was assumed preoperatively that most of the retention was in the difunctional specimen side due to PVE and multiple trans-arterial chemoembolization sessions were performed). The patient's FLR increased by only 39% despite waiting for 42 days, and after right hepatectomy, the patient had an estimated FLR of 34%, suggesting an inadequate regenerative capacity. Moreover, the Pringle maneuver had to be used three times with a total ischemic time of 45 min because of bleeding tendency resulting from severe cirrhosis during the parenchymal dissection; all these combined risk factors contributed to the patient's transient post-hepatectomy hepatic insufficiency. The upper limb deep vein thrombosis (only other complication) and a single mortality (a stroke from air embolism after a postoperative central line insertion for total parenteral nutrition) were not necessarily related to the laparoscopic approach. PVE is associated with increased liver-specific morbidities including post-hepatectomy hepatic insufficiency, but not overall morbidities, even in open major hepatectomy (which is less challenging than LMH) [21].

Another alternative competing strategy to preoperative PVE is associating liv-

er partition and portal vein ligation for staged hepatectomy (ALPPS) [22]; however, this strategy was traditionally reserved for non-cirrhotic parenchyma [22]. A recent study showed that PVE did not confer an additional increase in morbidity and mortality compared with ALPPS and did not find a statistically significant difference in overall survival between the two strategies. However, in cirrhotic patients, ALPPS was statistically significantly more effective in increasing the resectability pool, as PVE failed to induce sufficient hypertrophy to achieve the minimum required FLR to proceed to resection in 33 patients (67.7% resection rate) compared with the only one patient in the ALPPS group (97.8% resection rate) ($p = 0.001$) [22]. Another promising strategy to increase the FLR preoperatively is by combined hepatic and PVE (HPVE) [23]. A recent systematic review showed that HPVE has an 85.3% resection rate and the FLR volume hypertrophy increased, which ranged from 33% to 63.3% (compared with 71.3% in our series), with a 0% rate of post-hepatectomy hepatic insufficiency, 10.3% morbidity rate, and 5.1% mortality rate post-hepatectomy [23]. However, such a favorable outcome may be caused by the confounding effect of not controlling for non-cirrhotic parenchyma as only 5.9% of the sample had cirrhosis [23] compared with 6.6% cirrhosis rate and 66.7% fibrosis rate in our series. Considering this series of challenging cases, the morbidity, albeit relatively high, could be regarded as acceptable.

Nevertheless, this study has limitations, including small sample size, potential for selection bias due to patient recruitment from only one center, descriptive design, lacks comparisons between any active or passive group, and non-generalizable conclusions and results to different populations. The strengths of this study were as follows: all cases were performed by the same surgeon ensuring strict compliance to the protocol and diverse patient characteristics reflect the Korean patient population with liver cancer. This study should prompt further research to enroll a larger sample in a randomized controlled trial to explore the safety and feasibility of LMH after PVE in a more rigorous manner.

In conclusion, we believe that LMH after PVE may be feasible in highly selected patients, with adequate FLR increase after PVE (> 40%), in the hands of surgeon with more than 5 years of experience in LMH, in a high volume center (> 50 LMH/year), and relatively safe in the short term, and extended follow up is needed to determine its long term safety, keeping in mind that transection of the thick Glissonean pedicle requires a thick cartridge, and implementing the sling technique to protect the rem-

nant pedicle.

Conflict of interest:

Choon H. D. Kwon is a consultant of Covidien, Ethicon, and Novartis. All the other authors have no financial relationships with any pharmaceutical or device company.

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Original article :

A cross-sectional study of the predisposition to anxiety during pregnancy in Saudi Arabia: magnitude and risk factors

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Abstract

Background and aims:
Under normal circumstances, pregnancy is a somewhat stressful condition, but for women who are prone to anxiety, it can be more complex . The objectives of this study were to identify the magnitude of anxiety among pregnant women attending the Najran Maternity & Children's Hospital (Najran City, Saudi Arabia) and to examine the correlates that may play a role in the development of anxiety during pregnancy.

Methods:
This cross-sectional study was conducted at Najran Maternity & Children's Hospital. Data were collected from 410 women through questionnaire-based interviews to gather psycho-sociodemographic, medical and gestational data. The screening of anxiety was scaled by the generalized anxiety disorder-7 (GAD-7) scale.

Result:
A total of 410 pregnant women participated in this study. In total, 11% of the participants suffered from

الملخص

الخلفية و الاهداف:
في الظروف العادية ، يعتبر الحمل حالة مقلقة إلى حد ما ، ولكن بالنسبة للنساء المعرضات للقلق ، يمكن أن يكون الحمل أكثر تعقيدًا. تهدف هذه الدراسة الى تقييم الاستعداد للقلق أثناء الحمل بين النساء اللواتي يترددن على مستشفى نجران للولادة والأطفال (مدينة نجران، المملكة العربية السعودية) وتحديد عوامل الخطر.
طريقة البحث: أجريت هذه الدراسة المقطعية في مستشفى نجران للولادة والأطفال. تم جمع البيانات من ٤١٠ امرأة من خلال المقابلات المستندة إلى الاستبيان لجمع البيانات النفسية الاجتماعية والديموغرافية والبيانات الطبية والحمل. تم تقييم الاستعداد للقلق وفقا لمقياس القلق العام (GAD-7).

النتائج:
شاركت ٤١٠ امرأة حامل في هذه الدراسة. في المجموع، عانت ١١ ٪ من المشاركات من القلق أثناء الحمل. أظهر تحليل الانحدار متعدد المتغيرات المرض النفسي وكانت الضغوطات الرئيسية تنبئ عن القلق أثناء الحمل.

الخلاصة:
إن الاستعداد للقلق أثناء الحمل ليس شائعًا بين النساء اللاتي ترددن على مستشفى نجران للولادة والأطفال ويرتبط بالنتائج السلبية. إن توفير رعاية جيدة قبل الولادة للنساء الحوامل عن طريق فحص

anxiety during pregnancy. Multivariate regression analysis showed psychiatric illness and feeling of being stressed were significant correlates of anxiety during pregnancy.

Conclusion:
The anxiety disorder during pregnancy is associated with adverse pregnancy outcomes. Thus, the proper antenatal care to identify and manage anxiety among pregnant women might benefit the psychological and physical health of pregnant women, their children, and families. It is necessary to consider all possible various biopsychosocial factors that account for anxiety occurrence during pregnancy.

Keywords:
anxiety, pregnancy, screening, antenatal care, prevalence

القلق، وتعديل عوامل الخطر وإدارة المرضى وفقًا لذلك سيعزز من رفاهية الأم والطفل والأسرة على المدى الطويل

Introduction

Under normal circumstances, pregnancy is a somewhat stressful condition, but for women who are prone to anxiety, it can be more complex. In general, approximately 21% of pregnant women have clinically significant symptoms of anxiety [1]. Local studies have shown that the prevalence of anxiety during pregnancy ranges from 23.6% to 30% [2,3].

Anxiety during pregnancy is a predictor of adverse maternal and child outcomes [4].

Anxiety during pregnancy is associated with a variety of maternal consequences including increased number of irrational visits to health services, severe nausea and vomiting, pre-eclampsia, spontaneous preterm labor, unnecessary elective cesarean section, a more difficult labor and delivery with an increased risk of post-traumatic stress disorder (PTSD) symptoms related to birth [5]. Moreover, there are consequences of anxiety during pregnancy for the child including preterm birth, low birth weight, admission to neonatal intensive care and difficulties in receiving proper care after delivery [1]. The effects of anxiety during pregnancy on the health of the child are serious and long-term, including adverse biological, mental, and behavioral effects [6].

Biological changes during pregnancy might explain such emotional instabilities.

However, psychosocial, medical, and antenatal care factors may play a role in the development of anxiety during pregnancy. Correlational studies have shown significant associations between anxiety during pregnancy and low level of education, unemployment, unplanned pregnancy, no family support, no or low income, negative life events, multiparity, history of miscarriage, a history of depression, chronic disease and gestational diabetes [2,3,7].

Taking into account the seriousness of the pregnancy period, we have assessed our practice to a establish comprehensive care model for pregnant women either by prevention of anxiety or early detection to ensure better pregnancy outcomes.

The objectives of the study were to identify the magnitude of anxiety among pregnant women attending the Najran Maternity & Children Hospital in Najran, Saudi Arabia and to examine the correlates that may play a role in the development of anxiety during pregnancy.

Methods

This cross-sectional study was conducted at Najran Maternity & Children's Hospital, which provides the majority of antenatal care in Najran City, in southwestern Saudi Arabia, from June to August 2017. Using simple random sampling, 410 women were recruited from the study population consisting of all pregnant women attending the antenatal clinic (ANC) during the study period and provided verbal consent to participate in the study. The screening of anxiety was scaled by the generalized anxiety disorder-7 (GAD-7) scale. This is the most extensively validated screening tool used to measure the severity of GAD, with a score of 10 or more having good diagnostic sensitivity and specificity. This scale was created by Spitzer et al., with an educational grant from Pfizer Inc[8]. The Arabic translation was downloadable from patient health questionnaire (PHQ) screeners website (https://www.phqscreeners.com/select-screener/41); no permission is required to reproduce, translate, display or distribute this information. The scale consists of seven items and total scores range from 0 to 21. A score of 10 or greater is the cutoff for screening of anxiety and further evaluation is recommended [8].

While dependent variable is anxiety symptoms among pregnant women , and independent variables are all the psycho-sociodemographic, medical, gestational characteristics (age, nationality, educational status, occupation, history of psychiatric illness, family support, level of family support, feeling of being stressed, stress control, medical illnesses, medications, parity, cesarean section, miscarriage, gestational

age, risk categories, family planning, antenatal follow up, number of visits, antenatal care provider, and antenatal care place). All data were obtained through questionnaire-based interviews.

The study was conducted with the approval of the Research Ethics Committee of Najran University Faculty of Medicine. Participant confidentiality was ensured for the purposes of the study.

The statistical analysis program (SPSS v.21) was been used in the study in data entry and analysis, with the use of necessary statistical methods to achieve the objectives of the study. The following statistical methods were used: Frequencies & Percentages: which is used for describing personal data for the study sample. Mean: to identify the level for the generalized anxiety disorder-7 (GAD-7) scale. Standard Deviation: shows how much variation or dispersion exists from the average (mean). Chi-Squared Test: to test differences in the distribution of responses to questions. T-test for independent samples: To test the presence of statistically significant difference in the anxiety level among pregnant women attending antenatal clinic according to nationality and occupation. Analysis of Variance- ANOVA: To test for the presence of statistically significant difference in the anxiety level among pregnant women attending antenatal clinic according to age and education level. P-value ≤ 0.05 was considered to indicate statistical significance.

Results

In total, 410 pregnant women have participated in the study with a 100% response rate in direct interviews. The psycho-sociodemographic characteristics of the participants are shown in Table 1. The majority (69%) of the participants in this study were aged between 20 and 35 years and 88% were Saudi. Among the participants, 62% were educated to secondary level or below. Five (1.2 %) of pregnant women were diagnosed with a psychiatric disease. During pregnancy; 9% of the participants had feeling of being stressed, which most of them (73%)were under control.

Table 1. Psycho-sociodemographic characteristics of participants

Demographic/psychosocial data		No.	%
Age (years)	<20	23	5.6
	20–35	283	69.0
	>35	104	25.4
Nationality	Saudi	363	88.5
	Non-Saudi	47	11.5
Education level	Illiterate	44	10.7
	Primary	86	21.0
	Pre-university	125	30.5
	University	121	29.5
	Postgraduate	34	8.3
Occupation	Yes	87	21.2
	No	323	78.8
History of psychiatric illness	No	405	98.8%
	Yes	5	1.2%
Family support	Yes	397	96.8%
	No	13	3.2%
Level of family support (n = 403) (self-perceived)	Satisfied	393	95.9%
	Not satisfied	17	4.1%
Feeling of being stressed	No	373	91.0%
	Yes	37	9.0%
Stress control, (n = 37)	Under control	27	73.0%
	Out of control	10	27.0%

The medical characteristics of participants are shown in Table 2. Three hundred and seven (74.9%) of pregnant women had no medical history, The others (25.1%) had some chronic illnesses.

Table 2. Medical characteristics of participants

Medical data		No.	%
Medical illnessess	No illness	307	74.9
	DM	12	2.9
	HTN	13	3.2
	DVT	7	1.7
	Hypothyroidism	19	4.6
	Anemia	27	6.6
	Other	25	6.1
Medications history	No	336	82.0
	Yes	74	18.0

The gestational characteristics of participants are shown in Table 3. The majority (76.8%) of our participants were multiparous and 66% had no history of cesarean section. More than half of participants had planned for the preganancy and they were in the third trimester. Of the participants, 78% received regular follow-up during antenatal visits with 57% receiving follow-up health care from multiple providers.

Table 3. Gestational characteristics of participants

Gestational data		No.	%
Parity	Nulli-parous	95	23.2
	Para-4 or less	224	54.6
	Para-5 or more	91	22.2
Cesarean section	No	271	66.1
	One	81	19.8
	Two or more	58	14.1
Miscarriage	No	248	60.5
	≤2	140	34.1
	≥3	22	5.4
Gestational age	1st trimester	37	9.0
	2nd trimester	134	32.7

Gestational age	3rd trimester	239	58.3
Risk category	Low risk	355	86.6
	High risk	55	13.4
Family planning	Planned	211	51.5
	Unplanned	199	48.5
Antenatal follow-up	Regular	320	78.0
	Irregular	90	22.0
Number of visits	1–4	159	38.7
	5–11	251	61.3
Antenatal care provider	One	176	42.9
	Multiple	234	57.1
Antenatal care place	PHC	25	6.1
	Maternity hospital	150	36.6
	Private sector	2	0.5
	Mixed	233	56.8

The results of multivariate regression analysis predicting the correlates that have a role to play in the development of anxiety during pregnancy from the psycho-sociodemographic, gestational and medical variables are shown in Table 4. Where the results of Logistic regression analysis revealed that feeling of being stressed significantly increased the odds ratio of anxiety during pregnancy (P = 0.002). History of psychiatric illness also significantly increased the odds ratio of anxiety during pregnancy (P = 0.01).

Table (4): Correlationbetween anxiety during pregnancy and the psycho-sociodemographic, gestational, and medical characteristics

Variable	Odds Ratio	95% C.I.)		P-value
		Lower	Upper	
Age	1.270	.701	2.302	.430
Nationality	.879	.322	2.398	.801
Education level	.858	.632	1.164	.325
Occupation	.670	.294	1.529	.342
History of psychiatric illness	13.004	1.843	91.767	.010
Family support	2.943	.251	34.459	.390
Level of support (self -perceived)	.370	.041	3.316	.374
Feeling of being stressed	50.096	4.303	583.254	.002
Stress control,	.210	.032	1.368	.103
Medical history	1.106	.912	1.343	.306

Medications history	1.692	.644	4.446	.286
Parity	1.002	.555	1.809	.994
Cesarean section	1.400	.890	2.204	.146
Miscarriage	.987	.540	1.805	.967
Gestational age	.880	.412	1.880	.742
Risk categories	1.729	.713	4.195	.226
Family planning	1.154	.559	2.379	.699
Antenatal care	1.719	.540	5.474	.359
Number of visits	1.022	.816	1.280	.850
health provider	.295	.027	3.196	.315
Place of care	1.935	.624	5.999	.253

CI – Confidence Interval. *Significant at p-≤0.05.

Discussion

It is not unusual for a pregnant woman to be anxiouse about her and baby's health within normal coping capacity. However,untreated maternal anxiety during pregnancy may lead to negative obstetrical outcomes, postpartum effects, and impact on family health as well as the child [9]. The study to uncover how much the magnitude of the anxiety among pregnant women attending the Najran Maternity & Children's Hospital and what the correlates that may play a role in the development of anxiety during pregnancy.

It is found that around 11% of pregnant women have positive symptoms of anxiety and further evaluation is recommended. This figure is not consistent with the fact that one-third of the general population is affected by an anxiety disorder during their lifetime, the majority are women and particularly during midlife [10]. If we assume pregnancy is extra-stressor; so this percentage should increase during pregnancy. In a similar study conducted in Singapore, 12.5% of pregnant women had anxiety [11]. In contrast, a study in China identified anxiety in 20.6% of participants [12]. Furthermore, a study in urban South Africa showed a prevalence of anxiety disorders of 23% [13]. Another study in Brazil showed a high incidence (58.5%) of anxiety among pregnant women [14]. Moreover, a similar study conducted in Brazil showed 26.8% of participants suffered from anxiety [15]. A study conducted at the University Hospital of Imam Abdulrahman Bin Faisal University in Saudi Arabia showed 23.6% of participants experienced anxiety during pregnancy [2] .

This variation in the prevalence of anxiety during pregnancy suggests the role of cultural background in an assessment of the

psychological aspect of individuals. Problematically for identify the symptoms of prenatal anxiety, may be mistaken as normal changes of pregnancy. Even though mental health has advanced in recent times in neurobiology and psychopharmacology, but still its roots are in a sociological perspective. It is because the symptoms of mental illness are only expressed in a social context. Therefore; it is a necessity to realize that visualizing anxiety disorder is not exclusively biological and that there are various biopsychosocial factors that account for anxiety occurrence [16].

Although people differ in their definition of stressor, it is clear that there is a strong link between serious or long-lasting stress and the presence of anxiety symptoms during pregnancy. Where current studies suggest that prenatal stress is associated with preterm birth, low birth weight, and peripartum anxiety [17]. The study revealed that the odds of pregnant women who feel of being stressed to get anxiety are 50 times. Despite, the effects of stress on pregnancy are not well understood; certain stress-related hormones may play a role in causing certain pregnancy complications (e.g. high blood pressure, decrease immunity competency, and mental health). Therefore, reduce stress among pregnant women might benefit the psychological and physical health of mother and baby [17].

we also noted a strong association between prenatal anxiety symptoms and a history of psychiatric illness; odds antenatal anxiety was 13 times greater in those who have a positive history of psychiatric illness compared to those who have a negative history of psychiatric illness. Usually, anxiety disorders exhibit comorbidity with other Axis I diagnoses and this coexisting may be common in the pregnancy as well [18]. This agrees with a study conducted in Malaysia, where concluded that a positive history of mental illness and depressive comorbidity associated factors with antenatal anxiety [19].

Based on the sound clinical and social context; the study hypothesized that young age, providing satisfied family support, planned conceive, regular antenatal follow up, and free of medical illnesses might play a good role to prevent or minimize anxiety during pregnancy. Despite this may make a further explanation of the low prevalence of antenatal anxiety in the study, but we could not prove it or reject it statistically. A similar study was conducted at King Fahd University Hospital, in Al-Khobar city revealed that anxiety was higher among pregnant women with an unplanned pregnancy, recurrent miscarriage, and unemployment [2]. Moreover, one more study conducted in 2016 by King Abdulaziz Medical City (KAMC) in Riyadh, Saudi Arabia showed

pregnant Saudi women with no or low income, chronic disease, no family support reported high levels of stress [3].

Conclusion

Anxiety disorder during pregnancy is associated with adverse pregnancy outcomes. Thus, the proper antenatal care to identify and manage anxiety among pregnant women might benefit the psychological and physical health of pregnant women and their infants [20]. Comprehensively; it is necessary to consider all possible various biopsychosocial factors that account for anxiety occurrence during pregnancy.

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Original article :

Dietary Habits of Saudi Medical Students at King Saud bin Abdulaziz University for Health Sciences in Riyadh, Saudi Arabia

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Abstract

Background:
Young adults including college students, frequently have an unhealthy lifestyle and diet. In the current study, we aimed to assess the dietary habits and physical activity, as well asthe relationship with gender, economic status, and academic level ofSaudi medical students at King Saud bin Abdulaziz University for Health Sciences (KSAU-HS) in Riyadh, Saudi Arabia.

Methods:
The design was a cross-sectional survey study. Data was collected with a validated self-administered questionnaire.

Results:
The sample size realized as 259 participants, with just more than half of the sample (54%) male, anda mean age of 22±2.12 years.The majority (95.2%) of the malegroup reported consuming fast foods compared to 80.7% of the female group. For both genders, fast

الملخص

الخلفية:
معظم الشباب بالمجتمع وطلاب الجامعات لاسباب مختلفة يميلون الى تناول الاكل الغير صحي وعادات غذائية غير صحية. في هذه الدراسة كان هدفنا تقييم عادات الاكل والنشاط البدني وعلاقتها بالجنس, الحلة الاقتصادية والمرحلة الجامعية بين طلاب الطب في جامعة الملك سعود بن عبدالعزيز للعلوم الصحية بالرياض , المملكة العربية السعودية.

طريقة البحث :
تم عمل هذه الدراسة على طريقة استقضاء مقطعي. تم جمع البيانات عن طريق استبيان تم توزيعه.

النتائج:
عدد المشاركين بالدراسة كان ٢٥٩ طالب طب. ٥٤ بالمئة ذكور و ٤٩ بالمئة اناث. متوسط العمر ٢٢ سنة زائد او ناقص عامين. الغالبية العظمى من المشاركين ٩٥,٢ بالمئة من طلاب الطب الذكور يتناولون الوجبات السريعة. للإناث بلغت نسبة الاناث اللاتي يتناولن الوجبات السريعة ٨٠,٧ بالمئة. لكلا الجنسين, كانوا يتناولون الوجبات السريعة للعشاء. نسبة عالية من الذكور ومن ذوو الدخل المرتفع يتناولون المقليات والمعجناتاكثر من الاناث وذوو الدخل المنخفض. التمارين اليومية والاكل الصحي,بلغت نسبة المشاركين

foods were mostly consumed during dinner. The prevalence of consuming fried foods and pastrieswere higher in the male and high-income groups compared tothe female and low-income groups(64.1% and 66.7% vs. 50% and 45.7%, respectively, p-value<0.05). In terms ofexercise, only 37.1% were exercising regularly. The majority (66.7%) of the healthy diet group, exercised regularly.

Conclusion:

Fast food consumption was highly prevalent in Saudi medical students, especially in males and high-income students and only a small proportion was physically active on a regular basis. The current study highlights the need for encouraging a healthy lifestyle, healthy dietaryhabits as well as a physically active daily routine, for medical students.

Key words:

dietary habits, Saudi medical students, fast food, physical activity

الذين يداومون على التمارين اليومية ٣٧,١ بالمئة فقط. نسبة ٦٦,٧ بالمئة من الذين يناولون الاكل الصحي يداومون على التمارين اليومية.

الخاتمة:

تناول الوجبات السريعة شائع بين طلاب الطب خصوصا الذكور وذوو الدخل المرتفع. وعلى النقيض, نسبة قليلة من هؤلاء الطلاب يداومون على التمارين اليومية. وبذلك, دراستنا تحث على الحاجة الى التحفيز لتناول الاكل الصحي , العادات الصحية, والنشاط البدني

Introduction:

"Dietary habits are the total consumption of food, and an analysis of dietary habits provide evidence related to the food consumption habits within a large population, important for predicting disease risk [1]." "Food consumption differs between communities, depending on culture or personal preference. Every diet can be helpful or harmful to a person [2]." "An individual's health depends to a large degree on the food they consume, which may produce a feeling of wellbeing or diseases and conditions such as diabetes mellitus, obesity and hypertension [2] with a high risk of morbidity and mortality [3]." "Food is known to play a major role in the development of such diseases [4]."

"Dietary habits in younger age groups have public health implications because poor nutrition in childhood causes obesity and increased risk for type 2 diabetes, metabolic syndrome, and cardiovascular diseases [5]." "Younger people, including college students, frequently consumes an unhealthy diet, which may affect their health and increase their risk of obesity, di-

abetes and coronary heart disease [6.7]."

"Due to the accelerated growth in Saudi Arabia, food consumption and lifestyle have changed, affecting all age groups but mainly children and adolescents [8,9]." "Previous studies from Saudi Arabia investigating the dietary habits and lifestyle of children, adolescents and university students, reported that younger age groups tend to consume an unhealthy diet[10,11]."

"Reviewing the literature, few studies focused on medical students asit is accepted that they are exposed to clinical knowledge related tothe benefits of a healthy lifestyle and are knowledgeable about the poor outcomesrelated to an unhealthy diet [12,13]." Local studies in Saudi Arabia are limited. "Only one study which was from Al Qahtani (2016) [3] which reported that medical students, regardless of gender and academic year, are consuming an unhealthy diet and had a lifestyle compared with the population." The aim of the current study was to assess the dietary habits and physical activity, and their relationship with the gender, economic status, and academic level of the medical students at KSAU-HS. Knowing more about the dietary habits and lifestyle choices of Saudi medical students will facilitate the development of initiatives to create or increase awareness.

Materials and methods:

"This was a cross-sectional survey study of Saudi medical students at KSAU-HS. The data-collecting instrument was a pre-validated questionnaire [3], implemented after receiving permission to use the questionnaire from the corresponding author. "In addition to demographic data, the questionnaire included questions related to fast food consumption and physical activity, the frequency, income and academic level. The calculated sample size for this study was 259 medical students from both genders and all academic levels. Quota sampling has been used in the selection of the sample for using gender and academic year as strata. The population was firstly divided in male and female subgroups, and a specified proportion was selected for each academic year. The questionnaires were distributed to the students by the study authors, and they invited to completethe questionnaire after an explanation of the aims and objectives of the study, and assurance of confidentiality.

Statistical analysis:

An Excel spread sheet was used for data entry and SPSS 20 for the data management and analysis. Mean and standard deviation (SD) are used to describe numerical data (age and academic year), frequency and percentage to describe categorical data.

Results:

The sample size realized as 259 participants. Just more than half (54%) was male with the mean age of the sample22±2.12 years. Only a small proportion (1.9%) was married. Just more than half (52.9%, n=137) was pre-clinical students (2nd, 3rd and 4th year medical students) and 47.1% (n=122) was clinical students (5th and 6th year medical students). The majority (63.7%) of the sample reported a high income (≥20000 SAR) (Table 1).

Table 1: Subject characteristics (n=259)

Mean age (years)	22±2.12	n	%
Gender	Male	145	56
	female	114	44
College year	Preclinical	137	52.9
	Clinical	122	47.1
Marital Status	Single	254	98.1
	Married	5	1.9
Family income	Less than or equal 20000	94	36.3
	More than 20000	165	63.7

The dietary habits of the sample are displayed in Table 2. More males (69.7%) are consuming red meat compared to females (43%). Red meat consumption was also higher in the high-income group (61.2%) compared to 52.1% in the low-income group. Similar results were obtained for fried food consumption. A higher proportion of the male (64.1) and high-income (66.7%) groups consumed fried food and pastries compared to female (50%) and lower income group (45.7%). The differences were statistically significant (p-value<0.05 for both). In terms of breakfast, more females (50%) regularly ate a breakfast compared to males (42.1%). Notably, a statistically significant higher percentage of females had coffee in the morning than male (74.6% vs.55.2%, respectively, p-value=0.001).

Table 2: Details of dietary Habits

		n*	%
Gender& Red meat	Male	101	69.7
	Female	49	43.0
Income & Red meat	High income	101	61.2
	Low income	49	52.1
Gender & Fried food	Male	93	64.1
	Female	57	50.0
Income & Pastries	High Income	110	66.7
	Low income	43	45.7
Gender & Breakfast	Male	61	42.1
	Female	57	50.0
Gender & Coffee	Male	80	55.2
	Female	85	74.6

Table 3: Details about fast food consuming

			n*	%
Gender & Fast food	Male		138	95.2
	Female		92	80.7
Academic year & Fast food	Pre-clinical years		121	88.4
	Clinical years		109	89.3
Gender & Fast food per week	Male	Once or twice	60	41.4
		3 times or more	78	53.8

Gender & Fast food per week	Female	Once or twice	67	58.8
		3 times or more	24	21.9
Income & Fast food per week	High Income	Once or twice	79	47.9
		3 times or more	69	41.8
	Low income	Once or twice	48	51.1
		3 times or more	34	36.2
Gender & Fast food meal	Male	Lunch	25	18.2
		Dinner	70	51.1
		Lunch & Dinner	42	30.7
	Female	Lunch	24	26.1
		Dinner	40	43.5
		Lunch & Dinner	28	30.4
Income & Fast food money	High income	100<SR	24	15.1
		100-500 SR	108	67.9
		500> SR	27	17.0
	Low income	100<SR	32	35.6
		100-500 SR	44	48.9
		500> SR	14	15.6

.n refers to people who answer this question by yes*

The details of the fast food consumption in the sample are displayed in Table 3. The vast majority (95.2%) of the male group reported consuming fast foods, compared to 80.7% of the female group
(Figure 1 and 2). Regarding the relationship between the academic year and fast food consumption, a similar proportion of pre-clinical and clinical students reported consuming fast foods(88.4%, and 89.3% respectively).The frequency of fast food consumption was higher in the male group, with more than half (53.8%) reporting a consumption of three times or more per week. For the female group, more than half (58.8%) reported consumption once or twice per week. For both genders, the highest consumption occurred during dinner. For both low and high-income groups, the fast food related expenditure was between 100-500 SAR per month.

In terms ofexercise and dietary habits, only 37.1% indicated regular physical activity. A higher proportion (66.7%) of the healthy eating habits group, reported regular physical activity compared to the fast foods group with 63.2% reporting no physical activity. More than half of the breakfast and coffee drinking groups (54.2%, and 68.8%) reportedphysical activity. The results highlighted that participants eating less fast foods, reported a higher level of physical activity. In contrast, the group reporting no physical activity (48.5%) indicated consuming more than three fast food meals per week (Table 4).

Table 4: exercise & dietary habits

factor		n	%
Exercise regularly	Yes	96	37.1
	No	163	62.9
Exercise per week	One to 3 time	32	14.0
	More than 3 times	85	37.3

Exercise & healthy food	Exercise	64	66.7
	Do not exercise	74	45.4
Exercise & fried food	Exercise	47	49.0
	Do not exercise	103	63.2
Exercise & pastries	Exercise	49	51.0
	Do not exercise	104	63.8
Exercise & breakfast	Exercise	52	54.2
	Do not exercise	66	40.5
Exercise & coffee	Exercise	66	68.8
	Do not exercise	99	60.7
Exercise & fast food per week	1-2 times weekly	61	63.5
	3 or more weekly	24	25.0
Not exercising & fast food per week	times 1-2 weekly	66	40.5
	or more 3 weekly	79	48.5

Figure 1:

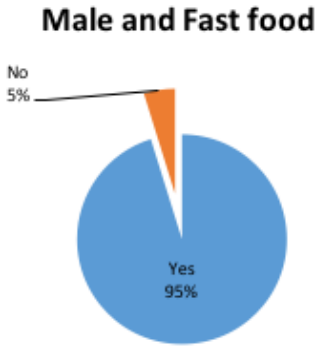
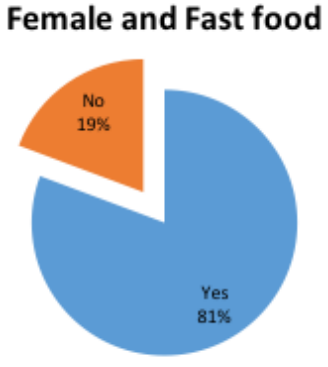


Figure 2:



Discussion:

"The current study aimed to evaluate the eating habits of medical students at a health sciences university in Riyadh, Saudi Arabia. Knowing dietary habits of future medical practitioners will support the development of an intervention to achieve potential health benefits for their future life[14]."

Irrespective of academic year and gender, there was a high consumption of an unhealthy diet in the sample. The unhealthy diet included consuming fast food and pastries frequently, with a low level of regular physical activities. "Our findings reflect the changed lifestyle of the whole Kingdom [15,18]." The medical knowledge acquired in the pre-clinical, clinical academic years failed to prevent the sample from adopting such emerging lifestyle habits." In a comparable Indian study, assessing the dietary habits, and physical activity of medical students at a teaching hospital, reported that healthy lifestyle practices including the awareness and practice of physical activity was good [19]." "This finding is in contrast to the current study with a high prevalence of unhealthy eating habits. More than half of sample did not have breakfast regularly; supported by Saranya et al [19] who reported that nearly half of the sample did not regularly have

breakfast, as well as Ganasegeran et al. and Chhaya et al [20,21].” “Students may associate skipping breakfast with weight control; however, it is known that participants who do not eat breakfast are more likely to eat unhealthy foods, resulting in weight gain[22].” “Breakfast is considered as the most important meal of the day, providing energy for the brain and improving learning. Breakfast contributes significantly to the total daily energy and nutrient intake, and omitting breakfast may affect the performance throughout the day [23].”

“Recent studies highlighted an association between the consumption of unprocessed red meat and processed meat and adverse health consequences, increasing risk for cancer [24], stroke [25], and all-cause [26] and cardiovascular mortality [27].” “Generally, dietary guidelines endorse limiting meat intake [28-30].” The current study revealed a high prevalence of red meat consumption, especially in males and high-income students.” Morse and Driskell investigating gender differences in fast food consumption in college students found that a larger percentage of males reported eating at fast food restaurants [31].” This is in line with the current study findings.

“Physical activities play an important role in maintaining health; however, Saudi adolescents tend to have a sedentary lifestyle and decreased physical activity [32].” “In a local study by Al-Nakeeb [33], a younger age in both genders had a decreased level of physical activity and a high percentage of obesity, compared to the same age group in the Birmingham and Coventry study in the United Kingdom.”

Fast food consumption, sedentary lifestyle, and obesity related diseases are increasing globallyand Saudi Arabia is not an exception. Modern food processing technologies contribute to this public health problem.” Overall, young Saudi population, which includes tertiary students, developed unhealthy dietary habits in addition to a sedentary lifestyle, created by the economic status improvement in the Kingdom of Saudi Arabia over the last 10 to 20 years[34].”

The current study has some limitations. The sample was restricted to medical students from one university in Riyadh, andthe findings cannot be generalized to the whole Kingdom. The body mass index (BMI) was not recorded and it was not possible to correlate the BMIwith fast food consumption and physical activity in the sample. Finally, fruit and vegetable consumption was not investigated.

Conclusion:

Fast food consumption was highly prevalent in Saudi medical student sample,

specifically in the male and high-income groups, regardless of their academic level. In addition, only a small proportion of the sample was physically activity. Health promotion interventions targeting medical students arehighly recommended, with a strong focus on the dietary pattern ofthe students. The current study reinforces the urgent need to encourage healthy lifestyles, healthy food habits and a physically active daily routine.

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Original article :

Main Referral Sources Based on Hospice Organizational Structure Variances in the United States

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Abstract

Background and Aim:
Referral contracts are an avenue for understanding the organizational structure of different hospice organizations. The aim of the study is to determine whether an organization's type and ownership impact patient referral patterns.

Methods:
A cross-sectional retrospective study was conducted among a nationally weighted representative sample of 620 hospice agencies in the United States. The survey responses were collected using a stratified, multistage probability design.

Results:
The data supported that hospice referral sources are impacted by organizational variations in ownership status. The data showed that 101(23.5%) of for-profit hospitals reported a hospital as their main referral source. Approximately 167(68.5%) of respondents reported hospitals which were the main referral sources, were part of a chain. For-profit hospice agencies were 7.82 times and 4.21 times more likely to have nursing homes and physicians' offices as the main

الملخص

الخلفية و الهدف:
تعتبر عقود الإحالة وسيلة لفهم الهيكل التنظيمي لمختلف مؤسسات التلطيفيه و الهدف من الدراسة هو تحديد ما إذا كان نوع المؤسسة و ملكيتها يؤثران على أنماط إحالة المرضى.

طريقة البحث:
أجريت دراسة استعادية مستعرضة لعينة ممثلة و مرجحة وطنيا من ٦٢٠ مؤسسة تلطيفية في الولايات المتحدة. وتم جمع ردود المسح باستخدام تصميم احتمالي متعدد المراحل

النتائج:
دعمت نتائج هذه الدراسة أن مصادر إحالة المرضى إلى مؤسسات الرعاية التلطيفيه تتأثر بالتغيرات التنظيمية وحالة الملكية. وأظهرت النتائج أن ١٠١ (٢٣,٥٪) من المستشفيات الربحية هى من مصادر الإحالة الرئيسيه للمرضى. كما أفاد حوالي ١٦٧ (٦٨,٥٪) من المستجيبين أن مصدر إحالتهم الرئيسية كان جزء من سلسلة مستشفيات . و كانت دور الرعاية التمريضيه و العيادات الطبية التى تمتلكها مؤسسات الرعاية التلطيفيه الربحية اكثر عرضة كمصدر إحالة رئيسي للمرضى ٧,٥ و ٤,٢١ مره على التوالى. كما بينت النتائج ان ٤٢٪ (نسبة الأرجحية المعدلة = ٠,٥٨ ؛ فاصل الثقة ٩٥٪ = ٠,٣٦-٠,٩) من مؤسسات الرعاية التلطيفيه غير الهادفة للربح أقل احتمالية أن يكون لديها مشرفون بدرجة ماجستير من أولئك الذين لديهم درجة البكالوريوس. واثبت الانحدار اللوجستي متعدد التغيرات إن مؤسسات الرعاية التلطيفيه غير الهادفة للربح من المرجح ٤,٤٢

patient referral source. Not-for-profit hospices were 42% (adjusted odds ratio = 0.58; 95% confidence interval = 0.36–0.9) less likely to have administrators with a master's administrator than those with a bachelor's degree. Not-for-profit hospices were 4.42 times and 1.72 more likely to be part of a change and have no formal contracts with outside sources.

Conclusion:

Hospice care is a comprehensive interdisciplinary approach to end-of-life care for patients. The referral sources are impacted based on their ownership statuses. Proper knowledge of hospice and hospice services delivery is essential to provide effective referrals. The data presents that internal and external factors play critical roles in the overall referral sources of hospice organizations.

Keywords:

Hospice care, referral sources, organization ownership, affiliation status

مرة جزءًا من التغيير ، و١,٧٢ ليس لديها عقود رسمية مع مصادر خارجية.

الخلاصة:

الرعاية التلطيفيه هي نهج شامل ومتعدد التخصصات لرعاية نهاية الحياة للمرضى. إلا أن مصادر الإحالة تتأثر بناءً على حالة ملكيتها. المعرفة الصحيحة عن الرعاية التلطيفيه وخدماتها أمر بالغ الأهمية لتوفير الإحالات بشكل فعال. تلعب

Introduction

For the past two decades, hospice use has been viewed as a measure for quality end-of-life care, with a dramatic increase in decedents using hospice from 23% in 2000 to 48.2% in 2017.[1] Furthermore, for-profit hospices has increasingly entered the U.S. market during the last decade.[1, 2] This privatization has affected access to and quality of hospice care.[3] Today, there are two main types of hospice ownership, for-profit and not-for-profit. For-profits tend to maximize their profits to meet the interests of stakeholders, while not-for-profits must satisfy the mandates and provisions set forth by the communities and charities that support them. In many cases, this includes accepting unfavorable risks to maintain their nonprofit tax status.[4] Furthermore, hospice care was created as a federal benefit reimbursable by Medicare more than three decades ago and provides comprehensive end-of-life care based on clinician support and services that, if deemed reasonable, may be elected by patients in any venue of care.[5]

Thus, physicians and hospital referral co-

ordinators should be aware of the impact that improper framing of their hospice services discussions might have on a patient[6] Hospitals are a major referral source for hospice organizations.[7] Studies have indicated that hospice services, along with palliative care consulting services, have increased patient and family satisfaction, improved quality of life, reduced lengths of stay in intensive care units, and decreased costs of hospitalization.[8-11] Within hospitals, increasing the knowledge of hospice services has proven to affect the amount and quality of referrals to hospice organizations.[12]

The timely referral of a patient to hospice can minimize the patient and caregiver's distress and can ensure that quality of care and quality of life are optimized.[13] Physicians are demanding reform to the process of referring patients to hospice. For physician offices and hospitals referring patients to hospices, having pre-established referral contracts are critical for the optimization of resources.[14] Despite the benefits of hospice care, there is a significant level of variation in who is enrolled in hospice, which is not based on patient or caregiver preferences. Studies have shown that health-care system characteristics, such as health maintenance, organization membership,[15] and region,[16, 17] contribute to hospice enrollment. However, to our knowledge, limited studies have explored the impact of ownership status on referral patterns. Therefore, the purpose of the study is to determine whether ownership status impacts patient referral patterns.

Methods

Design and Data Source

This study used a secondary cross-sectional retrospective design to analyze the U.S. National Home and Hospice Care Survey (NHHCS),[18] representing more than 15,000 agencies and 160,700 home health aides. The data is publicly available through the Centers for Disease Control and Prevention. Survey responses were collected by the Centers for Disease Control and Prevention using a stratified, multistage probability design. A detailed methods report on the NHHCS is on the NHHCS website at http://www.cdc.gov/nchs/nhhcs.htm.[18] The data was collected through in-person interviews with agency directors and through designated staff members. There was an omission of patients or their families and friends. Data pertaining to agency administrative records included the year the agency was established, the types of services the agency provided, and referral sources. There are three main types of agencies: home health, hospice only, and home health and hos-

pice. There were 1,036 agencies and data on 9,416 current home health patients and hospice discharges from these respected agencies. Inclusion criteria for the study was that the agencies provided hospice care only; 359 agencies were hospice care facilities. Because NHHCS is a sample survey and is designed to produce national estimates for agencies, patient discharges, and home health aides, data analyses must include sampling weights to inflate the sample numbers to national estimates. To help encompass a weighted average that resembled the onset of the general population, "strata stratum" and "weight sizagywt" were used.[18] Post implementing survey weight design; the final representative sample consisted of 620 hospice care facilities. The research was reviewed and categorized as "exempt" by the Institutional Review Board of the University of South Carolina because the study analyzed secondary data.

Measures

The outcome variable within this study is the number of referrals, based on a percentage of all hospice patients as a whole. This is significant because it will indicate the percentage of different referrals for a given type of hospice and any differences between referral sources. Although the outcome variable is not indicated on a per hospice basis, it does explore how differences within the hospice corporate structures are related.

Ultimately, this study explored variables that were based exclusively on hospice agencies. There are a number of exploratory independent variables that were explored through this study. These include type of hospice agency, type of ownership, agency director, formal contacts, and chain.

It is important to note that this information is solely descriptive. Home health organizations offering home health and hospice were omitted from the dataset. This did lower the number of observations that were available from 1,036 to 359, as previously noted, but it was believed that having a dataset that was completely homogeneous in respect to organization type was crucial to the sustainability of any findings. The variable of organizations offering home health and hospice was omitted, even though these organizations had a hospice part, because of the possible effect that having two different types of organizations might have on the overall findings of that subgroup. Ownership status was another focus area for this study.

Within this area, information was explored with respect to agency administration, contracts with outside agencies, and agency chain status. With respect to agency, there

were two main responses retained during analysis: for-profit and other. It is important to note that "other" included not-for-profit and government agency ownership. In exploring the basis of these variables, it is important to note that, in some cases, the organizations might be seen as a "hybrid." This refers to organizations that were for-profit but also had a variable organization division that assisted some patients. In these cases, even though there might be a nonprofit section, the overall organization was coded as for-profit. The recipients that answered "inapplicable/not ascertained," "refuse to answer," or "don't know" were omitted from the framework of the study.

When asked, "what is the agency's main patient referral source for hospice care," the responses were combined to help provide a better understanding of current trends. The respondents that answered "hospital" or "nursing home" were kept intact, while respondents that indicated "physician's office," "patients/family/friends," or "all others" were combined into a single group.

Consolidation with respect to the highest amount of education that an agency director or administrator received helped to streamline this variable. Respondents that indicated 'diploma degree in nursing', 'associate's degree in nursing', 'associate's degree in health-care administration', 'associate's degree' (other health-related), or 'associate's degree' (not health-related) were reassigned to a category that was renamed "associate's degree." Respondents that indicated 'bachelor's degree in nursing', 'bachelor's in health-care administration', 'bachelor's degree'

(other health-related), or 'bachelor's degree' (not health-related) were reassigned to a category that was named 'bachelor's degree.' Respondents that indicated 'master's degree in nursing', 'master's in health-care administration', 'master's degree' (other health related), 'master's degree' (not health related), or doctorate-level degree were reassigned to a category that was named "graduate degree." Respondents that indicated "other" were omitted.

Formal contracts play a major role within the organizational structure of hospice organizations. This was extremely evident when respondents were asked if their organizations had formal contracts with outside agencies or organizations to provide services to residents, assisted living, life care or a continuing care retirement community, hospital, skilled nursing facility, hospice, or managed organization. Respondents that answered "inapplicable/not ascertained," "RF," or "don't know" to any of these questions were omitted from the study.

A number of hospice organizations are

members of a chain; therefore, exploring the variables of being in a chain was important in this study. There were two main responses to this question. Respondents indicated either that they were part of a chain or that they were not part of a chain. Respondents that answered "inapplicable/not ascertained," "refuse to answer," or "don't know" were omitted from the study.

Statistical Analysis

STATA 14.2 was used to account for the complex, weighted, and clustered structure of the sample design. Statistical significance was determined by an alpha level of 0.05 and verified through a 95% (CI). We conducted univariate and bivariate chi-square analyses and reported, frequencies, percentages, and P-values. A logistic regression model was used to explore whether a hospice organization's type and ownership impact patient referral patterns. We also reported the P-values from the Wald statistics.

Ethical Considerations

In accordance with the policy of the University of South Carolina, the University's Institutional Review Board categorized the research as exempt because the study analyzed secondary data that is publicly accessible.

Results

The data for this study isolated respondents that were solely a hospice agency. This was done to help explore the findings in a hospice-only environment. Although this did decrease the number of available participants, it also helped to provide powerful insight into the hospice-only arena. The number of respondents dropped to a weighted 620 from a previous participant pool of 1,036. Table 1 shows the sample's descriptive statistics. About 63.1% (426) of referral sources are from hospitals, a little over a third (36.5%, n = 247) of administrators had diplomas, and another third (38.2%, n = 363) had master's degrees. The results of our cross-tabulation chi-square show a significant relationship between main referral source, highest degree of the administrator, part of a chain and having any formal contract with outside sources, and hospital ownership status.

Table 1: General Characteristics of Home Health and Hospice Agencies (NHHCS)

	Total	For-Profit	Others (Not-For-Profit, Government)
	n (%)	n (%)	n (%)
Main Referral Source*			
Hospital	426 (63.1%)	101 (23.7%)	325 (76.3%)
Nursing Home	85 (12.6%)	61 (71.8%)	24 (28.2%)
Physician's Office	164 (24.3%)	96 (58.5%)	68 (41.5%)
Highest Degree of Administrator*			
Diploma	347 (36.5%)	129 (37.2%)	218 (62.8%)
Bachelors	241 (25.3%)	114 (47.3%)	127 (52.7%)
Masters	363 (38.2%)	69 (19.0%)	294 (81.0%)
Affiliation			
Free Standing	362 (34.9%)	111 (30.7%)	251 (69.3%)
Non-Free Standing	674 (65.1%)	244 (36.2%)	430 (63.8%)
Part of Chain*			
Yes	244 (23.6%)	167 (68.4%)	77 (31.6%)
No	792 (76.4%)	188 (23.7%)	604 (76.3%)
Formal contact with outside source*			
Yes	801 (77.6%)	238 (29.7%)	563 (70.3%)
No	231 (22.4%)	114 (49.4%)	117 (50.6%)

* Indicated finding were significant with a $p<0.05$

For-profit hospice agencies were 7.82 times and 4.21 times more likely to have nursing homes and physicians' offices as the main patient referral source than hospitals (Table 2). Not-profit hospices were 42% (Adjusted Odds ratio (OR) = 0.58; 95% Confidence interval (CI) = 0.36, 0.9) less likely to have administrators with 'master's degrees' than administrators with 'bachelor's degrees'. Not-for-profit hospices were 4.42 times and 1.72 more likely to be part of a chain and have no formal contracts with any outside sources.

Table 2. Multivariable logistic regression to examine the association between hospice ownership and main patient referral source, adjusting for hospice characteristics, n=620

	Hospice Ownership Status	
	Adjusted OR	95% Confidence Limits
Main Patient Referral Source (Reference: Hospital)		
Nursing Home	7.82***	[4.33-14.14]
Physician's Office	4.21***	[2.57-6.89]
Administrator's Highest Degree (Reference: Bachelors)		
Diploma	1.07	[0.64-1.80]
Masters	0.58*	[0.36-0.93]

Affiliation (Reference: Non-Free Standing)		
Free Standing	0.79	[0.43-1.43]
Part of Chain (Reference=No)		
Yes	4.42***	[2.69-7.26]
Having any formal contact with outside source (Reference: Yes)		
No	1.72*	[1.13-2.63]

Exponentiated coefficients; 95% confidence intervals in brackets, 416 observations were removed due to missing data

Discussion

The number of hospice organizations has grown in the United States from a single hospice in 1975 to well over 3,400 organizations in 2016.[19] Current population trajectories suggest that hospice organizations will be utilized even more.[20] Our findings conclude that hospice referral sources are impacted based on their ownership status. We highlight that the optimal hospice structure consistent through all different environments is not present and that internal

(i.e., highest degree of administrator) and external (i.e., within the environment and hospice agency) factors play critical roles in the overall referral sources of hospice organizations.

There were three key findings from the multivariable analysis. The first shows that for-profit hospice agencies are more likely to receive referrals from nursing homes and physicians' offices than from hospitals. For-profit hospices typically have greater emphasis on nursing home referrals.[21] Hospices that are part of chains have the potential to achieve greater efficiency and quality through mechanisms, such as increased standardization, knowledge transfer, and enhanced information systems.[21] Based on a U.S. national study, approximately 27% of Medicare-certified hospices do not provide a single day of general inpatient care.[22] Based on information from the NHHCS, 32% of hospice agencies had no contracts with any hospitals, and half of those hospitals did not have a contract with a skilled nursing facility either. This ultimately resulted in a disconnect within the continuum of care, where hospices were unable to provide general inpatient care referrals for those in need of inpatient care.[22] By 2015, nursing homes contracted with 3.8 hospice agencies on average, while only 36% of nursing homes had residents receiving hospice from one (17%) or two (19%) agencies, with 20% of nursing home-hospice users receiving hospice and nursing home care from entities with overlapping financial interests.[16, 22] Meaning that the hospice organization and the nursing facilitates share ownership interests. Notwithstanding common

ownership between hospice agencies and nursing homes becoming more common, the broader health-care sector continues to consolidate and streamline its corporate organizational structure.[23]

We expanded the literature by our second key finding, which showed that not-for-profit hospices were likely to have administrators with higher educational attainment. To our knowledge, no research has examined the impact of administrative educational attainment level in hospice agencies. However, borrowing from the leadership literature, one of the major benefits of higher education in leadership can be traced to the incorporation of the interdisciplinary team approach to care[24] A study showed the major barrier for hospice providers is coordinating with the current caregiver, which is either a nursing home, staff member, or caregiver in a private residence. Poor provider relations can easily derail optimal care for the hospice patient, making barriers important to address when providing optimal hospice care.[25] The focus for leadership training and care coordination should be at the administration level.[26, 27] Nevertheless, transformational leadership within hospice has undergone several changes;[28] however, it continues to focus heavily on nurses rather than medical doctors and health administrators.[29] The components of transformational leadership, behavior, and characteristics are linked to hospice theory and hospice-specific practices.[30] Many believe this focus is rooted in the very beginnings of hospice. There is also a connection between nurse managers' attitudes about the existing organizational culture and the strategy of the top level and their management idea.[31] Within hospitals, increasing the knowledge of hospice services has proven to affect the amount and quality of referrals to hospice organizations.[32, 33] Ultimately, due to the changing health-care landscape and the incorporation of more nurses and other clinical staff in management positions, the overall organizational structure of hospices within the United States will continue to evolve.[29] Health care providers cite the huge burden in correctly estimating prognoses and care provided by hospice services.[34] Proper knowledge of hospice and hospice service delivery is critical to provide effective referrals.[35]

The third key finding highlighted that not-for-profit hospice agencies were more likely to be part of a chain and have limited or no formal established contracts with outside care delivery sources. Having a referral source between current health-care providers and a hospice organization would help mitigate any confusion that a patient and/or family member(s) might have.[36] Confusion over services combined

with emotional issues make the transfer to hospice a very important yet difficult choice with which many patients and/or caregivers are faced. Given that variations of services exist not only between different hospices but also hospices within the same region or large organization,[36] having a referral contract between health-care providers and hospice organizations could help mitigate confusion between service providers and help ease the anxiety associated with switching medical providers for patients, their caregiver(s), and their current health-care providers.[22, 37] Hospice care is generally viewed as a gold standard for life-limiting care.[25] It is believed by many health-care management executives that the need for hospice and home health care services will continue to increase over the next 30 years to accommodate the current "baby boomers" and our nation's continued population growth.[38] Thus, establishing formal contracts with external care providers will ensure smoother handoffs and easier transitions for the patients and providers.[39]

The study presented here has several limitations. The study uses a cross-sectional design, and thus, we are limited to examining associations. As this is the first and the only representative sample of hospice agencies, it provides us with advantages in understanding their key referral patterns and issues, which might persist over time. These findings justify follow-up surveys to understand the hospice industry and position the industry to meet the needs of an aging population. Our study fails to address patients' feelings about losing their health-care providers. The largest barrier that patients indicate when enrolling in hospice is the fear of losing contact with their current health-care providers.[34] Many qualified patients fail to utilize hospice services or enroll too late.[40]

Conclusion

Our study shows that hospice referral sources are impacted based on their ownership statuses. Future research needs to address patterns of referrals over time and to explore the impact of politics and practice changes on hospice referrals.

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Original article :

Surgeons Awareness, Practice, and Following guidelines for COVID-19 in Saudi Arabia

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Abstract

Background:
COVID-19 pandemic has sent an obnoxious wave of medical emergency all over world. Health care workers and subordinate medical services personals are vulnerable to COVID-19 transmission. With the growing number of cases, it becomes necessary to screen the health care workers for COVID-19 periodically. Surgeons should adhere to the strict precautions besides they should prepare operation room with certain standards to minimize the risk of virus spread

Aim:
to assess the awareness of COVID-19 and its related infection control practices among surgeons in Saudi Arabia.

Methods:
A cross sectional survey was conducted including all accessible surgeons in the governmental and private hospitals in of Saudi Arabia. Data was collected using pre-structured online questionnaire. The questionnaire included surgeons' personal data, academic position and setting. Awareness regarding COVID-19

الملخص

الخلفية :
تعتبر جائحة كوفيد ١٩موجة بغيضة من الطوارئ الطبية في جميع أنحاء العالم. إن العاملين في مجال الرعاية الصحية وشخصيات الخدمات الطبية الثانوية معرضون لانتقال كورونا على الرغم من عمليات رعاية المرضى المختلفة وسط أجهزة الحماية الشخصية وإجراءات مكافحة العدوى في المستشفى. مع تزايد عدد الحالات ، يصبح من الضروري إجراء فحص دوري للعاملين في مجال الرعاية الصحية لفيروس كورونا.يجب على الجراحين الالتزام بالاحتياطات الصارمة إلى جانب إعداد غرفة العمليات الجراحية بمعايير معينة لتقليل خطر انتشار الفيروس.

الهدف:
تقييم الوعي بمرض كوفيد١٩وممارسات مكافحة العدوى ذات الصلة بين الجراحين في المملكة العربية السعودية.

طريقة البحث:
تم إجراء مسح مقطعي مستعرض يشمل جميع الجراحين المتاحين في المستشفيات الحكومية والخاصة في المملكة العربية السعودية. تم جمع البيانات باستخدام استبيان مسبق التنظيم عبر الإنترنت. تضمن الاستبيان بيانات الجراحين الشخصية وموقعهم الأكاديمي وأماكن عملهم.تضمن الاستبيان درجة الوعي بشأن كورونا والاحتياطات المتعلقة بالعمل للجراحات تحت الوباء.

and work related precautions for surgeries under the epidemic.

Results:
A sample of 375 surgeons, 261 (69.6%) were general surgery staff. Exact of 99.5% of the surgeons reported that of COVID-19 transmission through respiratory droplets. About 91.7% of the surgeons selected immune-compromised persons as the risk group for COVID-19 infection then elderly (79.5%), and patients with chronic health problem (75.5%). Totally, good awareness level regarding COVID-19 was detected among more than three quarters of the surgeons.

Conclusions:
The study revealed that irrespective of the high awareness level recorded for the study participants regarding COVID-19 and its needed precautions. Pitfalls in many aspects especially at standards for surgeons work environment and screening for suspected cases need special precautions were noted.

Keywords:
COVID-19; Surgeons; Infection control; precautions; Awareness; Practice; Attitude

النتائج:
شمل المسح ثلاثمائة وخمسة وسبعين جراحًا ، منهم مئتين وواحد وستين (٦٩,٦٪) من تخصص الجراحة العامة والباقي من التخصصات الجراحية الأخرى. أفاد ٩٩,٥٪ من الجراحين أن انتقال كورونا يكون عبر قطرات الجهاز التنفسي. اختار حوالي ٩١,٧٪ من الجراحين الأشخاص الذين يعانون من ضعف المناعة كمجموعة خطر لعدوى فيروس كورونا تليها كبار السن (٧٩,٥٪) ، والمرضى الذين يعانون من مشكلة صحية مزمنة (٧٥,٥٪). بشكل عام ، تم الكشف عن مستوى وعي جيد بخصوص فيروس كورونا بين أكثر من ثلاثة أرباع الجراحين.

الاستنتاجات والتوصيات:
في الختام ، كشفت الدراسة أنه بصرف النظر عن مستوى الوعي المرتفع المسجل للمشاركين في الدراسة بخصوص فيروس كوفيد١٩والاحتياطات اللازمة له ، ولكن كانت هناك مزالق في العديد من الجوانب خاصة في معايير عمل الجراحين وفحص الحالات المشتبه فيها الذين يحتاجون إلى احتياطات خاصة.

Introduction

By the end of the year 2019 and the start of 2020, the world was faced by a rapidly spreading epidemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2(SARS-CoV-2) which later was classified by WHO as Pandemic. [1] The outbreak started in Wuhan, Hubei province, China, in December 2019. The World Health Organization (WHO) classified the disease as a Public Health Emergency of International Concern on 30 January 2020 and recognized it as a pandemic on 11 March 2020. [2, 3]As of 8 April 2020, nearly 1.44 million cases of COVID-19 have been diagnosed in 209 countries ,with about 83,400 deaths. [4, 5] The majority of cases were old aged ,but some children cases and few deaths

among children's were recorded.

Worldwide, the healthcare systems are obligated to work at more than maximum capacity for a number of months due to the COVID-19 outbreak making health care staff at risk to catch the infection and recording many deaths at all levels of the healthcare workers, several adjustments in surgical services will be required. [6, 7]WHO recommended many preventive measures to prevent disease transmission, of which, hand washing and social distancing (updated now to physical distancing) by minimizing close contact between individuals. Physical distancing was applied by many procedures, including quarantines, travel restrictions, and the closing of gathering areas including universities and schools. Individuals were informed either friendly or by law for social distancing methods by staying at home, limiting travel, avoiding crowded areas, using no-contact greetings, and physically distancing themselves from others. [8, 9] The objective of this study was to assess the awareness of COVID-19 disease and its related infection control practices among surgeons in Saudi Arabia.

Methodology

A cross sectional survey was conducted, including all accessible surgeons in the governmental and private hospitals in Saudi Arabia. The data was collected using a pre-structured online questionnaire developed by the researchers after intensive literature review and expert consultation as a panel of 3 consultants reviewed the items independently, and any discrepancy regarding any item was resolved by consensus at first then by voting. After having the final questionnaire format, it was raised online using social media platforms and sent to all surgeons using a snowball sampling method by the researcher and all his colleges. The survey uploaded from 1st March till 10th of April, 2020.The questionnaire included surgeons' personal data, academic position, and setting. Awareness regarding COVID-19 covered three main domains. General Awareness regarding COVID-19 and its transmission methods, infection control measures according to WHO guidelines, [10], and work related precautions for surgeries under the epidemic. Surgeons practice and attitude regarding COVID-19 cases were also assessed in the questionnaire last section. All participants' responses were downloaded and filtered for missing or incorrect data at the after online submission.

Data analysis

After data were extracted, it was revised, coded, and fed to statistical software IBM SPSS version 22(SPSS, Inc. Chicago, IL).

All statistical analysis was done using two tailed tests. P value of less than 0.05 was considered to be statistically significant. For awareness items, each correct answer was scored one point, and the total summation of the discrete scores of the different items was calculated. A surgeon with a score of less than 60% (17 points) of the maximum score was considered to have poor awareness, while good awareness was considered if he had a score of 60% (18 points or more) of the maximum or more. Descriptive analysis based on frequency and percent distribution was done for all variables, including demographic data, awareness items, and surgeons practice and attitude. Cross tabulation was used to assess the distribution of awareness according to surgeons' personal and practice data. Relations were tested using the Pearson chi-square test.

Results

The survey included 375 surgeons of which, 261 (69.6%) were general surgery staff, and the remaining 114 (30.4%) were fine surgery staff. Exact of 296 (78.9%) of the surgeons worked at governmental hospitals and 43 (11.5%) worked at the private sector while 36 (9.6%) were the academic staff. Regarding their position, 200 (53.3%) of the respondents were consultants and 116 (31%) were specialists, and 59 (15.7%) were residents.

Table 1 illustrates surgeons' awareness regarding COVID-19. An exact of 99.5% of the surgeons reported that of COVID-19 transmission through respiratory droplets. About 91.7% of the surgeons selected immune-compromised persons as the risk group for COVID-19 infection followed by elderly (79.5%), and patients with a chronic health problem (75.5%). Regarding clinical symptoms, fever was recorded by 97.3% of the participants, followed by cough (90.7%). The correct incubation period (15 days) was reported by 84.5% of the surgeons. As for infection control precautions, hand washing as a measure to reduce the risk of infection was reported by 96% of the surgeons, followed by keeping a safe distance from others (90.4%). Washing hands with soap and water were recorded by 94.1% of the surgeons, and washing for 30 seconds or more was reported by 53.6%. About 91% of the surgeons reported intubation as a risky procedure for catching an infection and nasopharyngeal swab as a test sample was identified by 74.4% of the sample, while 13.9% know about Oropharyngeal swab. Using negative pressure operating room was reported by 77.1% of the surgeons, and 69.3% reported the need for a separate anaesthesia machine for suspected or infected cases

only. Only 61.1% of the surgeons reported that they know the protocol in their department for infected cases need surgery. Totally, good awareness level regarding COVID-19 was detected among 78.9% of the surgeons.

Table 1. Surgeon awareness regarding COVID-19 in Saudi Arabia

Domain	Awareness items		No	%
General awareness	Mode of COVID-19 transmission	Blood transfusion	8	2.10%
		Feco-oral	25	6.70%
		Respiratory droplet	373	99.50%
		Sexual Intercourse	7	1.90%
	The most risky people for severe infection	Elderly	298	79.50%
		Immune-compromised	344	91.70%
		Co morbidity Patients	283	75.50%
		Young	15	4.00%
	Clinical symptoms of COVID-19	Fever	365	97.30%
		Cough	340	90.70%
		Fatigue	262	69.90%
		Diarrhea	160	42.70%
	Incubation period	3 days	4	1.10%
		5 days	26	6.90%
		10 days	28	7.50%
		15 days	317	84.50%
Infection control measures	Measures could reduce the risk of infection	Regular Hand Washing	360	96.00%
		Wearing Surgical Mask	246	65.60%
		Safe distance from the others	339	90.40%
		Take regular vitamin C tablet	41	10.90%
	Method for hand disinfection	Water with soap	353	94.10%
		Alcohol Rub	229	61.10%
		Water	15	4.00%
	Effective duration of hand washing	5 seconds	5	1.30%
		10 seconds	4	1.10%
		20 seconds	165	44.00%
		30 or more	201	53.60%
	Safety distance needed during communication	1-2 m	329	87.70%
		2-3 m	44	11.70%
		3+ m	2	0.50%
	Procedures would increase the risk of infection	Intubation	343	91.50%
		Tracheotomy	194	51.70%
		NGT Insertion	205	54.70%

Infection control measures	What kind of test sample do you prefer to choose for COV-ID-19?	Nasopharyngeal Swab	279	74.40%
		Blood	29	7.70%
		Oropharyngeal swab	52	13.90%
		Sputum	15	4.00%
Work related precautions	The ideal operating room for emergency surgery for suspected or confirmed cases	Negative Pressure	289	77.10%
		Positive Pressure	32	8.50%
		Don't know	54	14.40%
	Need a separate an-aesthesia machine for suspected or infected cases only	Yes	260	69.30%
		No	48	12.80%
		Don't know	67	17.90%
	Know the protocol in your department for infected cases need surgery	Yes	229	61.10%
		No	77	20.50%
		Don't know	69	18.40%
	Know about PPE	Yes	359	95.70%
		No	16	4.30%
Overall awareness		Poor	79	21.10%
		Good	296	78.90%

Considering surgeons practice (table 2), 62.4% of the surgeons spend most of the time in the hospital and 76.3% of them change their clothes/scrub before and after the shift. Also, 5.3% of the surgeon reported that they shack hands during their duties, and only 27.2% Screen low risk patient for COVID-19 before emergency surgery but 70.9% screen high risk patients. About 89% of surgeons use personal protective equipment (PPE) during dealing with suspected or infected patients.

Table 2. Surgeon practice regarding COVID-19 in Saudi Arabia

Practice regarding COVID-19		No	%
Are you wearing surgical mask inside the Hospital?	No	30	8.0%
	Sometimes	111	29.6%
	Yes	234	62.4%
Do you change your clothes/scrub before and after the shift?	No	35	9.3%
	Sometimes	54	14.4%
	Yes	286	76.3%
Do you shake hands during your duty?	No	334	89.1%
	Sometimes	21	5.6%
	Yes	20	5.3%

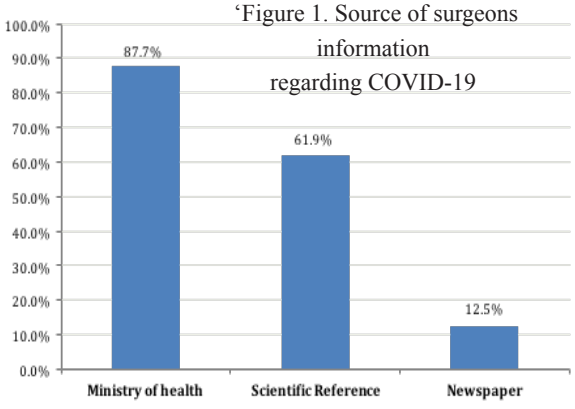
Screen low risk patient for COVID-19 before emergency surgery	Yes	102	27.2%
	No	273	72.8%
Screen high Risk patient for COVID-19 before emergency surgery	Yes	266	70.9%
	No	109	29.1%
Your precaution before operating in high risk/ infected cases	Standard	43	11.5%
	Using PPE	332	88.5%

Table 3 demonstrates surgeons' attitudes towards COVID-19 patients. About 59% of the surgeons worried about having infection with COVID-19, and 42.7% relax to do daily duty despite infected cases in the hospital. Exact of 58.4% of the surgeons willing to do duties in Emergency or Critical Care Department.

Table 3. Surgeon attitude regarding COVID-19 in Saudi Arabia

Surgeon attitude	No	%
Are you worried/ anxious to have infection with COVID-19?		
No	37	9.9%
Sometimes	117	31.2%
Yes	221	58.9%
Relax to do daily duty despite infected cases in your hospital		
No	132	35.2%
Yes	160	42.7%
Don't know	83	22.1%
Willing to do duties in Emergency or Critical Care Department		
No	156	41.6%
Yes	219	58.4%

As for surgeons source of information regarding COVID-19, 87.7% reported the ministry of health followed by scientific references (61.9%), and newspaper (12.5%). (Fig.1)



'Figure 1. Source of surgeons information regarding COVID-19

On relating surgeons data with their awareness level (table 4), 85% of the consultants had a good awareness level compared to 59.3% of the residents with recorded statistical significance (P=.001). Also, 85.1% of those who had their information from scientific sources had good awareness level compared to 79.9% of those who had information from ministry of health (P=.001). About 81% of the surgeons who screen for high risk patients before surgery had a good awareness level compared to 74.3% of those who didn't (P=.049). All other factors were insignificantly related to surgeon's awareness level (P> 0.05) for all.

Table 4. Distribution of surgeon awareness level according to their personal data and practice

Factors			Awareness level				P-value
			Poor		Good		
		No	%	No	%		
Speciality	ENT		1	10.0%	9	90.0%	.168
	General surgery		54	20.7%	207	79.3%	
	Maxillofacial		3	60.0%	2	40.0%	
	Obstetrics/ Gynaecology		0	0.0%	4	100.0%	
	Ophthalmology		3	21.4%	11	78.6%	
	Orthopaedic		8	36.4%	14	63.6%	
	Paediatric		2	11.8%	15	88.2%	
	Plastic		0	0.0%	6	100.0%	
	Thoracic		1	11.1%	8	88.9%	
	Vascular		7	25.9%	20	74.1%	
Work field	Academic		7	19.4%	29	80.6%	.502
	Governmental		60	20.3%	236	79.7%	
	Private		12	27.9%	31	72.1%	
Position	Resident		24	40.7%	35	59.3%	.001*
	Specialist		25	21.6%	91	78.4%	
	Consultant		30	15.0%	170	85.0%	
Screen high Risk patient for COVID-19 before emergency surgery	Yes		51	19.2%	215	80.8%	.049*
	No		28	25.7%	81	70.3%	

Do you change your clothes/scrub before andafter the shift?	No		9	25.7%	26	74.3%	.578
	Sometimes		9	16.7%	45	83.3%	
	Yes		61	21.3%	225	78.7%	
Do you shake hands during your duty?	No		69	20.7%	265	79.3%	.684
	Sometimes		6	28.6%	15	71.4%	
	Yes		4	20.0%	16	80.0%	
Source of Knowledge about COVID-19	Ministry of health		66	20.1%	263	79.9%	.001*
	Scientific Reference		30	12.9%	202	87.1%	
	Newspaper		7	14.9%	40	85.1%	

P: Pearson $X^{2\,test}$

P < 0.05 (significant *

Discussion

The current study aimed to assess surgeons' awareness, practice and perception regarding infection control measures and precautions with the current COVID-19 pandemic attacking nearly the whole countries all over the world. This is vital as medical staff is the first defence line against the virus and they are daily exposed to intensive doses of the virus due to patient's care, which makes them at higher risk for catching the infection and even death. This was reported in different countries with a high mortality rate among their medical staff at all categories. This high risk makes the staff more careful and should follow more strict precautions than the general population and this was the WHO recommendation for the health care team. [11, 12] All medical staff included in the management of COVID-19 suspected cases must adhere to airborne precautions, hand hygiene, and donning of personal protective equipment. All aerosol-generating procedures should be achieved in an airborne infection isolation room. Double-gloving, as a daily practice at the unit, might provide extra protection and reduce spreading through contamination to the surrounding equipment after intubation. [13] Surgeons are one of the medical staff that is at risk of managing COVID-19 suspected or even confirmed cases for an emergency. They should adhere to the same strict precautions. Besides they should prepare the operation room with certain standards to minimize the risk of virus spread. Due to the lack of scientific evidence and information regarding the new virus and mode of transmission, surgeons should be aware of what is available and should do their

best for tracking safe behaviours.

The study revealed that awareness among surgeons regarding COVID-19 and infection control measures was satisfactory as about 3 out of each four had good awareness level. The awareness level was very good for the mode of transmission, clinical signs and symptoms, and incubation period but population at risk were identified by a moderate amount of surgeons, especially patients with the chronic health problem. Regarding infection control measures, surgeons recorded very high awareness except for duration of hand washing which was questionable to be wrongly recorded by nearly half of the surgeons but this can be explained by that the recommended duration was not proved scientifically as some scientific communities recorded at least 20 minutes and others recommended for 30 minutes. As for work related procedures to minimize the infection rate, two thirds only of the surgeons reported that they had clear protocol to deal with emergent cases, which is a defect in their work environment. Also, not all surgeons were aware of the nature of the emergency operating room standards with negative pressure and independent anaesthesia machine.

Regarding surgeons' practice, not all surgeons change their clothes/scrub before and after the shift and nearly 10% don't avoid shaking hands, which are un-recommended behaviour especially during work time. Also another significant finding was that about one third of the surgeons don't Screen High Risk patients for COVID-19 before emergency surgery, which is very dangerous and may make the surgeon to deal more loosely with these cases which are potential source of infection.

Considering surgeons perception regarding dealing with COVID-19 cases, more than half of the surgeons were worried about having infection with COVID-19 but also half of them willing to do duties in Emergency or Critical Care Department. Surgeons should be updated with any new precautions of guidelines. They may be a source of infection for many cases as they mainly deal with disabled patients using invasive procedures which all ideal environment for infection spread. If surgeons are unaware of all precautions, especially for medical staff, this will expose them to be infected, which causes more viral spread besides more shortage in the available staff already existing all over the world.

Conclusions and recommendations

In conclusion, the study revealed that irrespective of the high awareness level recorded for the study participants regarding COVID-19 and its needed precautions, but there were pitfalls in many aspects,

especially at standards for surgeons work environment and screening for suspected cases which require special precautions. Continuous exploring for the new information and standards is recommended for the medical personnel in general and surgeons who need more specific precautions in particular. This is the responsibility of the surgeons themselves and the ministry of health and scientific clubs who should at least construct online health education awareness sessions timely.

Data Availability

The data used to support the findings of this study are included within the article.

Ethical Approval

Ethical approval was obtained from the ethical committee of Najran University (06-09-1-2019), and informed written consent was obtained from all participants.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Funding

No funding agency, it was conducted on the researcher own cost

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Original article :

Practice and Awareness of the General Population About Common Over the Counter Analgesics Dependence and Side Effects in Al-Madinah, Saudi Arabia

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Abstract

Background and aims:
Over the Counter (OTC) medication usually used for the management of minor illness and they are available for the patients and can be obtained from the community pharmacies. The most common OTC analgesics that were associated with dependence are those capable of causing tolerance. OTC analgesics are generally non-harmful if used appropriately.
The objectives of this study are to measure the prevalence and determine the pattern of using OTC analgesics among Al-Madinah population, and to assess their awareness and attitude regarding the related side effects and dependence.

Methods:
Cross-sectional study focused on Al-Madinah city, Saudi Arabia, from February 2019 to Augusts 2019, by using validated modified questionnaire distributed by using web-based link.
The sample size was 600 participants. Data was analyzed by SPSS.

الملخص

الخلفية والأهداف:
الأدوية اللاوصفية تستخدم عادة لعلاج الأمراض البسيطة، وهي متاحة للمرضى ويمكن الحصول عليها من صيدليات المجتمع. إن المسكنات اللاوصفية الأكثر شيوعًا والتي كانت مرتبطة بالاعتماد هي تلك القادرة على إحداث التحمل. عادة ما تكون المسكنات اللاوصفية غير ضارة إذا تم استخدامها بشكل مناسب.
تهدف الدراسة الى قياس مدى انتشار استخدام المسكنات اللاوصفية ووصف نمط استخدامها بين سكان المدينة المنورة بالمملكة العربية السعودية، وتقييم وعيهم فيما يتعلق بالآثار الجانبية ذات الصلة والاعتماد.

طريقة البحث:
هذه دراسة مقطعية أجريت في المدينة المنورة بالمملكة العربية السعودية في الفترة من فبراير ٢٠١٩ إلى أغسطس ٢٠١٩ باستخدام استبيان معدل تم توزيعه عن طريق رابط على شبكة الإنترنت. بلغ عدد المشاركين في الدراسة ٦٠٠ مشارك.

النتائج:
بلغت نسبة انتشار استخدام المسكنات اللاوصفية خلال الأشهر الستة الماضية ٨٥,٨٪ (٩٥٪ CI، ٨٣٪ - ٨٨,٧٪). كان الباراسيتامول والإيبوبروفين أكثر أنواع المسكنات استخداماً. أظهرت الدراسة أن الوعي بالآثار الجانبية للمسكنات اللاوصفية مرتفع (٦١,٨٪) في حين كان الوعي بشأن المخاطر المحتملة للاعتماد ٤٤,٢٪، كما

Results:
The prevalence of analgesics usage during the past 6 months was 85.8% (95% CI, 83% – 88.7%). The most common type of analgesics was paracetamol and Ibuprofen. Awareness regarding the side effects of OTC analgesics was high (61.8%) while the awareness regarding potential risk of dependence was 44.2%. The most common causes of taking OTC analgesics were headache and toothache, while the most common source of information was self-knowledge, whereas stomachache was the most common side effect from OTC analgesics.

Conclusion:
Even though most of the general population in this study have sufficient knowledge about the side effects of OTC analgesics and that it may cause dependence or addiction, however, OTC analgesic usage of the general population is highly prevalent.

Keywords:
Over the Counter, Medication, Analgesics, Awareness, side effects, dependence, General population.

أظهرت أن الأسباب الأكثر شيوعًا لأخذ هذه المسكنات هي الصداع وآلام الأسنان، بينما كان مصدر المعلومات الأبرز هو المعرفة الذاتية، في حين كان ألم المعدة هو التأثير الجانبي الأكثر حدوثاً.

الخلاصة:
على الرغم من أن غالبية المشاركين في هذه الدراسة لديهم معرفة كافية حول الآثار الجانبية للمسكنات اللاوصفية، والتي قد تسبب الاعتماد أو الإدمان، إلا أن استخدامها لعامة السكان لا يزال منتشرًا بشكل كبير.

الكلمات المفتاحية:
بدون وصفة طبية، الأدوية، المسكنات، الوعي، الآثار الجانبية، الاعتماد، عامة السكان.

Introduction

Over the counter (OTC) medication can be defined as "the practice of using drugs that have not been prescribed, recommended, or controlled by a certified health care professional"[1] .They are usually used for management of minor illness, and they are available for the patients and can be obtained from the community pharmacies. The most common over the counter medications are analgesics. Analgesics that were associated with dependence are those capable of causing tolerance. For example, codeine-containing analgesics [2,3]. The psychological aspects of addiction may occur with any substance, including OTC drugs [4]. Dependency "is defined as the repeated use of an OTC drugs in which the person has a need or desire to use the OTC drug and has difficulty in voluntarily stopping or altering their use [5]. OTC analgesics are non-harmful if used appropriately. There is need for people education in order to prevent the misuse of OTC analgesic [6]. Analgesics like non-steroidal anti-inflam-

matory drugs (NSAIDs) and acetaminophen (paracetamol) are the most commonly used OTC drugs in the world [7,8]. Twenty-five percent of the patients who take NSAIDs, faced adverse events, even with prescription. Several cases of deaths were associated with acetaminophen overdoses [9,10]. Paracetamol is a commonly used analgesic, which is acting on the hypothalamus center, through inhibition of prostaglandin synthesis to produce an antipyretic effect, it also may work in the periphery to block the pain impulses generation by inhibiting prostaglandin synthesis in the central nervous system and increasing pain threshold. It is commonly used for analgesia and fever. Its side effects include disorientation, dizziness, gastrointestinal hemorrhage, laryngeal edema, liver failure, and nephrotoxicity [11].

NSAIDs like Diclofenac, Ibuprofen, and Aspirin have analgesic effect by inhibiting cyclooxygenase (COX 1-2). It has anti-inflammatory and antipyretic activity, and it may inhibit platelet aggregation. Its side effects include headache, abdominal pain or cramps, constipation, diarrhea, dizziness, dyspepsia, nausea, vomiting, edema, and gastrointestinal ulceration or bleeding [12].

Anti-inflammatory drugs had their origins in the serendipitous discovery of certain plants and their extracts being applied for the relief of pain, fever, and inflammation. The chemical advances of the 20th centuries lead to the development of NSAIDs [13].

Al-Madinah is a large city which is in the west of the Kingdom of Saudi Arabia (KSA), its population is 1,700,000 according to the General Authority of Statistics at 2010 [14].

Usage of NSAIDs as analgesic is common. According to one of the studies, the top utilized medication class in KSA were analgesics specifically Diclofenac Sodium with percentage of (67%) [15].

One of the recently conducted cross sectional studies in Al-Madinah, showed that (72.5%) of the citizen reported the use of OTC drugs, and (24.3%) of the responses showed history of experiencing side effects from using OTC medication [1].

Other cross-sectional study was done on Riyadh city - KSA, showed a total of 285 medications were bought without a prescription. The most common medications dispensed without prescriptions were antibiotics (22%) and analgesics/antipyretics (19%). Also, it showed that (35%) of 538 patients does not know the side effects of the OTC drugs they use [16].

Another study done on KSA showed that the use of antibiotics and analgesics still accounted for the bulk, followed by proton pump inhibitors and anti-diabetics drugs

respectively[17]

According to a systematic review on the Middle East countries, showed that these areas have a high frequent use of OTC drugs, and KSA was in the fourth place by 35.4% (83% in Iran, 68.1% in Pakistan, and 42.5% in Jordan) [18].

Another study was on Jordan showed that NSAIDs use was (69%), Diclofenac was the most common type used, and 58% reported having side effects from NSAIDs use. Gastrointestinal upset was the most reported side effect. Patient's awareness regarding NSAIDs use was poor, and pharmacist role in counseling was inadequate [19].

A cross sectional study in United Kingdom general population showed that dependence rate was more common with analgesics, sleep aids, and nicotine products [17].

Studies showed high prevalence of OTC analgesics usage in Saudi Arabia in general. Also, there is limited data about dependence and side effects awareness of OTC analgesics especially in Al-Madinah. Also, the researchers have a clear observation of lack of awareness about common OTC analgesics dependence and its related hazards among general population, that may lead to severe side effects especially among the high-risk groups. The lack of awareness and knowledge highlighted the need for more researches in this area. This is the first paper in KSA that documented the relationship between potential side effect and awareness of dependence on OTC analgesics.

The objectives of the current study are to measure the prevalence and describe the pattern of using OTC analgesics among Al-Madinah population and to assess their awareness and attitude regarding the related side effects and dependence.

Methods

Through a cross sectional study focused on Al-Madinah city, KSA, started from February/2019 to Augusts/2019. The study sample was drawn from a total of 1,700,000 individuals lives in Al-Madinah with 95% confidence interval and 5% marginal error. The calculated sample size was 384. During data collection, we collect 600 responses and stopped receiving data after that.

Inclusion criteria: adults older than 18 years old, male and female, resident in Al-Madinah city. Exclusion criteria: less than 18 years old and those who lives outside Al-Madinah region.

The study tool was a modified validated questionnaire that consist of three sections: 12 questions on participant’s demography, 18 questions regarding practice and awareness of side effects, and 7 questions about

practice and awareness of dependence.

Group of medical students, belonging to medical college, distributed electronic self-administered structured questionnaire in Arabic language to get the responses from participants through public social media (WhatsApp, twitter, and Facebook). All responses who met the inclusion criteria for age and residency were included. Source of the validated modified questionnaire is from Babakor SD et al [17] and Fingleton N et al [18]. The consent has been taken from the authors, and the questions were translated to Arabic language and double reviewed by two doctors at Taibah University.

The data had been gathered through MS Excel and after data cleaning and data re-coding, it was then exported to statistical packages for social science's version 20 for further tabulation and subsequently for statistical data analyses. Both descriptive and inferential statistics had been performed where numbers and percentages were used to present all categorical variables and mean ± standard deviation for all continuous variables. A p-value cut off point of 0.05 at 95% CI used to determine statistical significance. The analyses measure the relationship between a dependent variable against independent factors by using chi square test.

An official permission was taken from the scientific ethical committee of Taibah medical college. An informed consent for this study was obtained from all participants after describing the aim of the study. The privacy and confidentiality of the participants were assured.

Results

The total sample size was 600, 53.5% females and 46.5% males. The age range was from 18 to 73 years old (mean 32.5). Nearly all participants were Saudis (92.3%) with 51.2% of them being married. Most of them were university degree (67.3%) and are currently working (46.7%). Parents were mostly less educated and unemployed. More than a half of them were high earner (57.8%) (Table 1).

Table 1: Socio demographic characteristics of participants

Study Variables	N (%) (n=600)
Age group in years	
18 – 20 years	65 (10.8%)
21 – 30 years	270 (45.0%)
31 – 40 years	105 (17.5%)
41 – 50 years	109 (18.2%)
>50 years	51 (08.5%)
Gender	
Male	279 (46.5%)
Female	321 (53.5%)
Nationality	
Saudi	554 (92.3%)

Non-Saudi	46 (07.7%)
Marital Status	
Single	273 (45.5%)
Married	307 (51.2%)
Divorced	11 (01.8%)
Widowed	09 (01.5%)
Level of education	
Primary	13 (02.2%)
Secondary	109 (18.2%)
Diploma	28 (04.7%)
University	404 (67.3%)
Postgraduate	46 (07.7%)
Occupation	
Employed	280 (46.7%)
Unemployed	98 (16.3%)
Retired	27 (04.5%)
Student	195 (32.5%)
Education of mother	
Less than university	383 (63.8%)
University or higher	217 (36.2%)
Mother employment status	
Employed	154 (25.7%)
Unemployed	446 (74.3%)
Education of father	
Less than university	351 (58.5%)
University or higher	249 (41.5%)
Father employment status	
Employed	298 (49.7%)
Unemployed	302 (50.3%)
Monthly household income (SAR)	
<3,000	47 (07.8%)
3,000 – 5,000	81 (13.5%)
5,001 – 10,000	125 (20.8%)
>10,000	347 (57.8%)

The prevalence of OTC analgesic usage for the past 6 months was 515 (85.8%). Of those (33.8%) of them were using OTC analgesics more than 3 times. Regards pain intensity (60%) of them suffered from severe pain, 33.8% were moderate and 7.8% were mild. The commonest analgesic medication for the last 6 months was paracetamol (85.6%), followed by ibuprofen (43.9%) and diclofenac (22.1%), the least of them was aspirin (12.4%). There were (18.7%) of the participants with chronic diseases. (Table 2).

Table 2: Self Medication and Analgesics History

Statement	N (%) (n=600)
Did you take any OTC Analgesics during the past 6 months?	
Yes	515 (85.8%)
No	85 (14.2%)
How many times did you take OTC Analgesics during the past 6 months?	
Once	66 (11.0%)
Twice	97 (16.2%)
Three times	156 (26%)
More than 3 times	203 (33.8%)
Not sure	78 (13%)
Do you suffer from any chronic diseases?	
Yes	112 (18.7%)
No	488 (81.3%)
Pain Intensity (VAS)	
Mild (0 – 3)	47 (07.8%)
Moderate (4 – 6)	203 (33.8%)
Severe (≥7)	350 (58.3%)
Type(s) of analgesics used for the last 6 months? *	
Paracetamol	441 (85.6%)
Ibuprofen	226 (43.9%)
Diclofenac	114 (22.1%)
Aspirin	64 (12.4%)

OTC – Over the counter.

Table 3 presented the patients' knowledge about OTC analgesics, its side effects and

dependency. More than (60%) of them had enough knowledge regarding the side effects, while (42%) of them had previously encountered side effect from OTC analgesics. When asked about the side effect of excessive use of OTC analgesics, majority of them accounted kidney toxicity (44.2%), followed by liver toxicity (38%), and gastrointestinal irritation and bleeding (25%). A high proportion of the participants (44.2%) agreed that OTC analgesics might cause dependence or addiction. Most of them did not consider themselves an OTC analgesic dependent. Few of them (14.3%) experienced withdrawal symptoms when they stopped using OTC analgesics.

When assessing the relationship between the use of OTC analgesics against the socio demographic characteristics of participants, a relationship was found between age group and the use of analgesic. Prevalence in 21 – 30 age group was higher (p-0.013). Those who were working are higher of using analgesic (p-<0.001). Those individuals who do not have a history of chronic diseases are more using OTC analgesics (p-0.039). Other social, demographic factors had no relationship.

We also evaluated the relationship between

Table 3: Patient knowledge about OTC Analgesics side effects and dependency

Statement	N (%) (n=600)
Do you know the side effects of OTC analgesics?	
Yes	371 (61.8%)
No	229 (38.2%)
What are the side effects of excessive use of OTC analgesics? *	
Liver toxicity (Hepatotoxicity)	228 (38.0%)
Kidney toxicity (Nephrotoxicity)	265 (44.2%)
Cardiac toxicity	50 (08.3%)
Gastrointestinal irritation and bleeding	150 (25.0%)
Rash	117 (19.5%)
Did you encounter any side effect(s) from self-medication with analgesics?	
Yes	252 (42.0%)
No	348 (58.0%)
Some OTC Analgesics may cause dependence or addiction	
Strongly disagree	71 (11.8%)
Disagree	135 (22.5%)
Neither	55 (09.2%)
Agree	265 (44.2%)
Strongly agree	74 (12.3%)
Have you ever considered yourself dependent on or addicted to OTC Analgesics?	
Yes – in the past month	44 (07.3%)
Yes – more than a month ago	57 (09.5%)
No - never	499 (83.2%)
Have you ever experienced withdrawal symptoms (feeling sick) when you stop using OTC Analgesics?	
Yes	86 (14.3%)
No	514 (85.7%)

OTC – Over the counter.

* Variable with multiple responses.

the awareness of OTC analgesic side effects and the socio demographic characteristics of participants. Female participants were aware of side effects (p-<0.001). The Saudis have more knowledge regarding the side effects (p-0.042). Those who were working and who earned more than 10,000 Saudi Arabian Riyal (SAR) monthly detected to be more knowledgeable about the side effects (p-0.028), (p-<0.001) respectively. History of chronic diseases has a relationship to the side effects awareness (p-0.036).

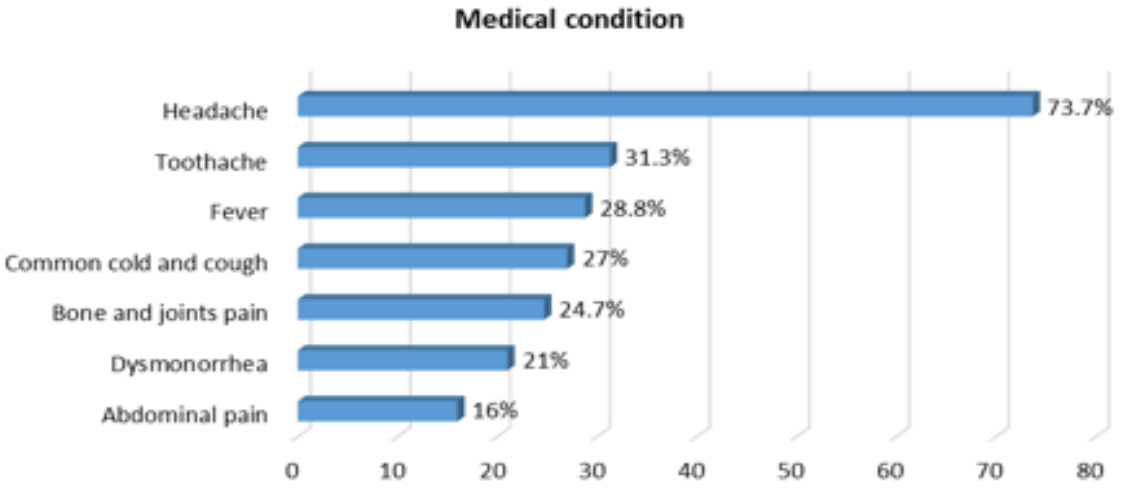
We further measured the association between the awareness of dependence on OTC analgesics and the socio demographic characteristics of participants. Those in 21 – 30 years old group and females were aware about the potential risk of dependence on OTC analgesics (p-0.038), (p-<0.001) respectively. Those who were working have lack of knowledge regarding OTC analgesic dependence. P-0.003 as shown in table 4.

Table 4: Relationship between "use of OTC analgesics", "awareness of OTC analgesics side effect", "awareness of dependence on OTC analgesics" and the Socio demographic characteristics of participants (n=600)

	OTC Analgesic			Side effect of Analgesic			Dependency to OTC			
	Yes N (%) (n=515)	No N (%) (n=85)	P-value §	Yes N (%) (n=371)	No N (%) (n=229)	P-value §	Disagreed N (%) (n=206)	Neutral N (%) (n=55)	Agreed N (%) (n=339)	P-value §
ɔup in years										
18 – 20 years	51 (09.9%)	14 (16.5%)		37 (10.0%)	28 (12.2%)		15 (07.3%)	07 (12.7%)	43 (12.7%)	
21 – 30 years	229 (44.5%)	41 (48.2%)		164 (44.2%)	106 (46.3%)		87 (42.2%)	23 (41.8%)	160 (47.2%)	
31 – 40 years	97 (18.8%)	08 (09.4%)	**0.013** **	60 (16.2%)	45 (19.7%)	0.285	34 (16.5%)	08 (14.5%)	63 (18.6%)	**0.038** **
41 – 50 years	99 (19.2%)	10 (11.8%)		75 (20.2%)	34 (14.8%)		44 (21.4%)	10 (18.2%)	55 (16.2%)	
>50 years	39 (07.6%)	12 (14.1%)		35 (09.4%)	16 (07.0%)		26 (12.6%)	07 (12.7%)	18 (05.3%)	
Male	237 (46.0%)	42 (49.4%)	0.561	150 (40.4%)	129 (56.3%)	**<0.001** **	118 (57.3%)	36 (65.5%)	125 (36.9%)	**<0.001** **
Female	278 (54.0%)	43 (50.6%)		221 (59.6%)	100 (43.7%)		88 (42.7%)	19 (34.5%)	214 (63.1%)	
ılity										
Saudi	474 (92.0%)	80 (94.1%)	0.505	349 (94.1%)	205 (89.5%)	**0.042** **	186 (90.3%)	49 (89.1%)	319 (94.1%)	0.172
Non-Saudi	41 (08.0%)	05 (05.9%)		22 (05.9%)	24 (10.5%)		20 (09.7%)	06 (10.9%)	20 (05.9%)	
Status										
Single	232 (45.0%)	41 (48.2%)	0.156	177 (47.7%)	96 (41.9%)	0.104	80 (38.8%)	26 (47.3%)	167 (49.3%)	0.246
Married	268 (52.0%)	39 (45.9%)		181 (48.8%)	126 (55.0%)		118 (57.3%)	29 (52.7%)	160 (47.2%)	
Divorced	07 (01.4%)	04 (04.7%)		05 (01.3%)	06 (02.6%)		04 (01.9%)	0	07 (02.1%)	
Widowed	08 (01.6%)	01 (01.2%)		08 (02.2%)	01 (0.40%)		04 (01.9%)	0	05 (01.5%)	
f education										
Primary	10 (01.9%)	03 (03.5%)	0.093	07 (01.9%)	06 (02.6%)	0.080	04 (01.9%)	03 (05.5%)	06 (01.8%)	0.384
Secondary	88 (17.1%)	21 (24.7%)		55 (14.8%)	54 (23.6%)		33 (16.0%)	15 (27.3%)	61 (18.0%)	
Diploma	26 (05.0%)	02 (02.4%)		19 (05.1%)	09 (03.9%)		11 (05.3%)	03 (05.5%)	14 (04.1%)	
University	347 (67.4%)	57 (67.1%)		262 (70.6%)	142 (62.0%)		140 (68.0%)	30 (54.5%)	234 (69.0%)	
Post graduate	44 (08.5%)	02 (02.4%)		28 (07.5%)	18 (07.9%)		18 (08.7%)	04 (07.3%)	24 (07.1%)	
tion										
Employed	252 (48.9%)	28 (32.9%)	**<0.001** **	170 (45.8%)	110 (48.0%)	**0.028** **	114 (55.3%)	30 (54.5%)	136 (40.1%)	**0.003** **
Unemployed	86 (16.7%)	12 (14.1%)		51 (13.7%)	47 (20.5%)		33 (16.0%)	07 (12.7%)	58 (17.1%)	
Retired	17 (03.3%)	10 (11.8%)		15 (04.0%)	12 (05.2%)		12 (05.8%)	02 (03.6%)	13 (03.8%)	
Student	160 (31.1%)	35 (41.2%)		135 (36.4%)	60 (26.2%)		47 (22.8%)	16 (29.1%)	132 (38.9%)	
y household income										
<3,000	38 (07.4%)	09 (10.6%)	0.265	22 (05.9%)	25 (10.9%)	**<0.001** **	12 (05.8%)	06 (10.9%)	29 (08.6%)	0.622
3,000 – 5,000	65 (12.6%)	16 (18.8%)		40 (10.8%)	41 (17.9%)		30 (14.6%)	07 (12.7%)	44 (13.0%)	
5,001 – 10,000	108 (21.0%)	17 (20.0%)		68 (18.3%)	57 (24.9%)		37 (18.0%)	13 (23.6%)	191 (56.3%)	
>10,000	304 (59.0%)	43 (50.6%)		241 (65.0%)	106 (46.3%)					
of chronic diseases										
Yes	103 (20.0%)	09 (10.6%)	**0.039** **	79 (21.3%)	33 (14.4%)	**0.036** **	41 (19.9%)	16 (29.1%)	55 (16.2%)	0.065

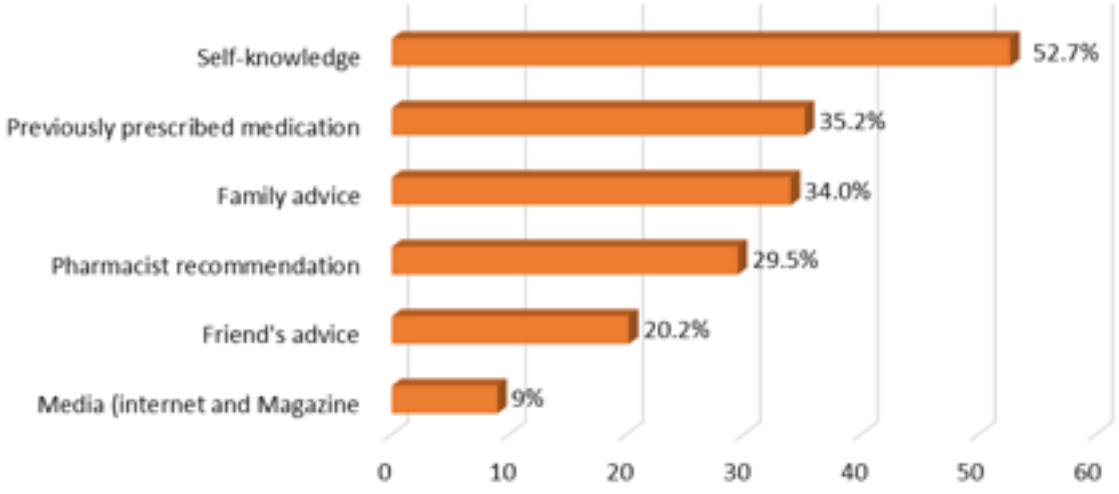
Figure 1 described the causes for taking up self-medication. The most common causes were headache (73.7%), followed by toothache (31.3%) and the least of them was abdominal pain (16%).

Figure 1: Causes for taking analgesics



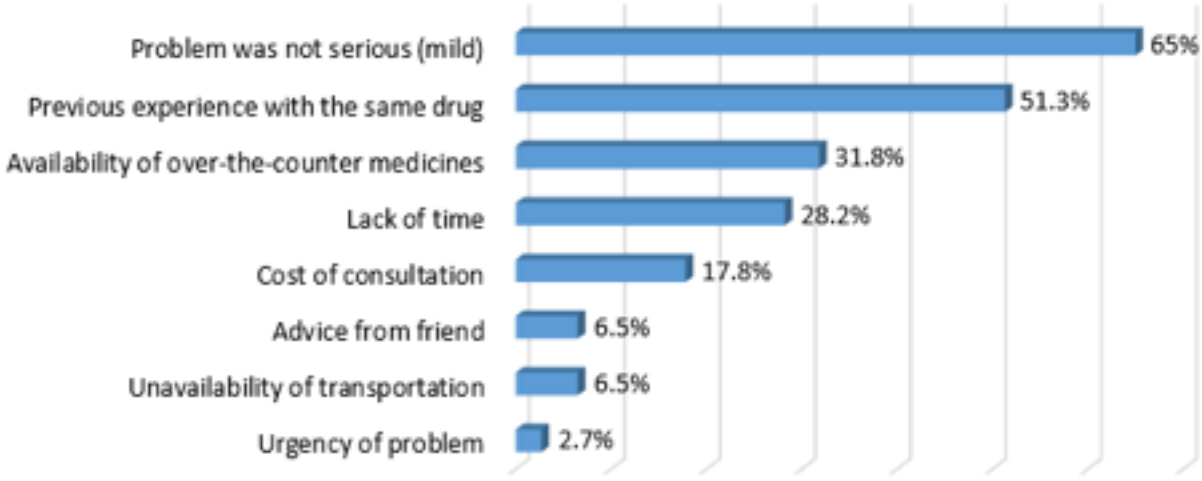
The most common sources of information were self-knowledge (82.7%) and previously prescribed medication (35.2%), media was the least (9%) (Figure 2).

Figure 2: Sources of information



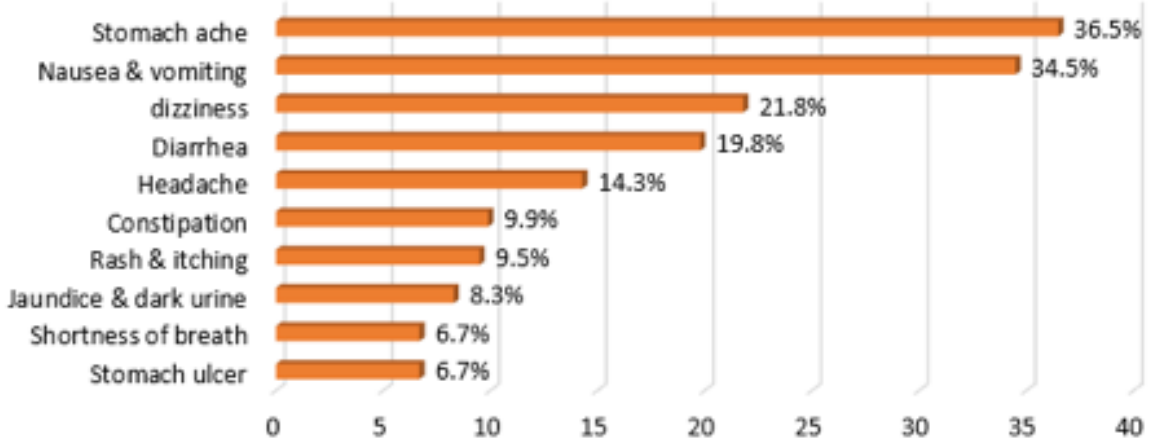
The commonest reasons for using self-medication were a problem that wasn't serious (65%), followed by previous experience with the same drug (51.3%), the least of them was urgency of problem (2.7%) (Figure 3).

Figure 3: Reason for using self-medication with analgesics



The most common side effects of self-medication with analgesics were stomachache (36.5%), followed by nausea & vomiting (34.5%), the least of them was shortness of breath and stomach ulcer (each 6.7%) (Figure 4).

Figure 4: Side effect of self-medication with analgesics



Discussion

The current study investigated the practice and awareness of the general population about common OTC analgesics dependence and their side effects. In this study, the practice of OTC analgesics for the past 6 months was high (85.8%). Several published papers documented the usage of OTC analgesics was highly prevalent among people with minor health issues [18,21]. In Saudi Arabia, OTC analgesics us-

age among medical students has a range of (55% - 77%) [22-24]. Among patients attending primary health care (PHC) center the prevalence was (84.4%)(20). In abroad the prevalence of OTC analgesics usage has a range of (45% - 65.5%) [25,26]. However, one paper showed a prevalence of OTC analgesics usage of (47%) only in a week duration [21].

In our study, (85.6%) of the participants indicated the usage of paracetamol in the past 6 months. Various articles reported paracetamol as the most common OTC analgesic being used to treat many kinds of illnesses, Babakor reported (86.1%) of patients attending PHC centers in Jeddah used paracetamol for self-medication [18]. In Jazan University (62%) of the female students used paracetamol as headache treatment [22]. In India (47.2%) of the medical students used paracetamol as self-medication [27]. In Norway they reported (40%) of paracetamol usage. The availability of paracetamol in many convenience stores helps many patients in the treatment of minor illness ignoring the risk of dependence or overuse. Moreover, ibuprofen and diclofenac were the secondary choice of the general population among OTC analgesics. The finding is concurrent from the study published by Babakor and Alghamdi as well as Shivamurthy et al [18,27]. It is mostly used for more severe pain like toothache and pain that does not respond to paracetamol.

The most common reasons for taking OTC analgesic were “the problem was not serious” and “it was previously prescribed medication.” This is consistent from the study published both local and abroad [18, 24,25,27]. In Bangladesh, the most common reason was the “remedy is known” and “high fee of doctor” [28]., which could be related to the health care system there. Albasheer reported “sufficient information” and “previous experience” were the most common reasons for students to take self-medication [26].

The most common symptoms were headache and toothache were the most common symptoms being identified by the participants in this study, which is like most of the published papers. Different papers documented headache as the most common reason for OTC analgesics usage [20, 24,25,27]. Menstrual pain was the most common symptoms being indicated by the female students in Jazan University [22]. Aashi as well as Ira reported fever as the most common reason for self-medication [23,28]. Albasheer, documented that pain management was the main reason for medical students to take self-medication like sedatives [27].

The knowledge of participants regarding the potential side effects of taking OTC an-

algesics was enough, where stomachache as well as nausea and vomiting were widely prevalent among them, this is expected by high level of educated participants. Shivamurthy, detected (61.2%) of the undergraduate medical students were aware of the side effect of analgesic self-medication [27]. Similarly, Albasheer reported that undergraduate medical students were knowledgeable about the harmful effect of self-medication(26). Babakor and Salih [18,22]., reported lack of knowledge in patients and female students about the harmful effect of OTC analgesics.

Young adult (21 – 30 years) detected to be more associated with the use of OTC analgesic. We further determined that those who were working and without history of chronic diseases were more associated with the use of analgesics self-medication. Babakor revealed those illiterate and highly educated were associated with the highest prevalence of OTC analgesic usage [18]., because they are more liable for minor work injuries or headache that may need analgesics. Ibrahim reported age group, educational year, residual status and father occupation were the significant factors of self-medication with analgesics in the past 6 months [24]. Subhashini accounted gender, locality and socio-economic status were having relation with self-medication [27].

Females, Saudis, those who were working, those who were high earners, and those without history of chronic diseases have higher knowledge of the side effects. Concerning to the awareness of dependence on OTC analgesics, females and young adult were more agreed of the potential cause of drug dependency. Those who were working were more disagreed of the potential effect of drug dependency. Females are more attractable to details especially in health, young and high earners are more likely to have technology that can assist them, and they have better access to IEC materials.

Conclusion

Even though most of the general population in this study have enough knowledge about the side effects of OTC analgesics and that it may cause dependence or addiction, however, OTC analgesics used in the general population is high. Paracetamol is the most common OTC analgesic used by the population. Headache is the most common symptoms. Stomachache and vomiting are the most common side effects. Age group, occupation, and history of chronic disease are the predictors of OTC analgesics usage.

The study recommends that, medical practitioners' effort is necessary in order to educate the general population about the

proper medication for a certain illness to allow safe use of OTC analgesics. Also, the knowledge, attitude, and practice of OTC analgesics misuse is advised to be further investigated in the future studies.

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Original article :

Cerumen knowledge and ear cleaning practices among medical students in Saudi Arabia: An observational study

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Abstract

Background and Aims:
Cerumen (earwax) is naturally secreted in human ears and can cause ear obstruction. When individuals attempt to remove cerumen from their own ears with tools, it can cause cerumen impaction, injuries, and otitis externa, which are risk factors for hearing loss. Clinicians need to educate their patients accordingly; thus, medical students should have sufficient knowledge of the topic. Here, we investigated the knowledge، awareness، and practices of cerumen and ear self-cleaning approaches among medical students at Al Imam Mohammad Ibn Saud Islamic University, Saudi Arabia.

Methods:
This cross-sectional study was conducted between June and July 2020. A questionnaire was distributed to medical students to determine their knowledge and practices of cerumen and ear cleaning. Correlations assessed relationships between demographic factors and knowledge.

الملخص

الخلفية و الاهداف:
يُفرز الصملاخ (شمع الاذن) بشكل طبيعي في آذان الانسان ولكن قد يسبب انسداد الاذن في بعض الاحيان، وذلك بسبب ازالة شمع الاذن من قبل الافراد مما يودي الى انحشار الشمع او اصابة القناة السمعية الخارجية او حدوث التهابات في الاذن الخارجية. وعلى ذلك فان تثقيف المراجعين من قبل الاطباء يعد امراً هاماً, كما يجب ان يكون لدى طلاب الطب المعرفة الكافية عن كل ما يتعلق بتنظيف شمع الاذن واضراره، وقد قمنا في هذه الدراسة بقياس مستوى المعرفة والممارسات لآلية التنظيف الذاتي لشمع الاذن بين طلاب وطالبات الطب البشري بجامعة الامام محمد بن سعود الاسلامية بالمملكة العربية السعودية.

طريقة البحث:
في هذه الدراسة المقطعية العرضية، تم مسح المعرفة والممارسات لتنظيف شمع الاذن مابين يونيو و يوليو ٢٠٢٠م في جامعة الامام محمد بن سعود الاسلامية بالمملكة العربية السعودية عن طريق توزيع الاستبيان على ٨١٤ من الذكور والاناث من طلاب وطالبات الطب البشري لتحديد مستوى معرفتهم و والممارسات بتنظيف شمع الاذن واضراره، حيث تم تحليل ردودهم باستخدام برنامج الحزمة الإحصائية للعلوم الإجتماعية (SPSS)، الإصدار البرمجي رقم ٢٢.

النتائج:
تم استكمال ٧٠٨ استبياناً مكتملاً للتحليل الاحصائي من اصل ٨١٤

Results:
Of 814 medical students who received the survey, 708 students completed the questionnaire (response rate = 86.9%). Males represented 61% of the sample. Most (73%) were aged 21 to 25 years; of them, 64% had cleaned their own ears, mostly with cotton buds (79%), in order to remove cerumen (30.8%). Overall, 85% of students had good knowledge; this was affected by gender and college years. Predominantly, 81% of students had high-risk practices.

Conclusions:
Although most medical students had a good level of knowledge about cerumen, many cleansed their own ears using cotton buds, despite knowing that it could harm the ear. As completing an otolaryngology course had marked effects on knowledge levels, we recommend further awareness programs to increase knowledge among preclinical students.

Keywords:
cerumen, cotton buds, ear self-cleaning mechanism, epithelial migration, external auditory canal, medical practitioners, otolaryngologists, students

(معدل الاستجابة =٨٦,٩٪) ، حيث ان ٦١٪ من المجيبين كانوا من الذكور وقد كان معظمهم ٧٣٪ تتراوح اعمارهم بين ٢١ و ٢٥ عاماً وقد كانو بالسنة الدراسية الثانية٢٤,٣٪ و الثالثة٢١,٥٪ . ومن بين هؤلاء قام ٦٤٪ منهم بتنظيف آذانهم باستخدام اعواد القطن بنسبة ٧٩٪ لتنظيفها من شمع الاذن . وبشكل عام فان ٨٥٪من طلاب وطالبات الطب لديهم معرفة جيدة وقد لُوحظ ان تلك النسبة تتأثر بالجنس وسنوات الكلية الدراسية ولكن وجدنا ان ٨١٪ من طلاب وطالبات الطب لديهم ممارسات عالية المخاطر بالرغم من معرفتهم بها.

الخلاصة:
توضِّح الدراسة الحالية بأن طلاب وطالبات الطب البشري في جامعة الامام محمد بن سعود الاسلامية على علمٍ كافٍ بتنظيف شمع الاذن ومضاره، وبالرغم من ذلك فان العديد منهم قامو بتنظيف شمع الاذن باستخدام اعواد القطن، وكما انه تم ملاحظة ان طلاب السنوات السريريه واللذين اتمو مادة طب وجراحة الانف والاذن والحنجرة على مستويات اعلى بالمعرفة من غيرهم، نوصي بمزيداً من برامج التوعية عن اضرار ازالة شمع الاذن خاصة بين طلاب السنوات التحضيرية.

الكلمات المفتاحية:
الصملاخ، اعواد القطن، آلية تنظيف الاذن الذاتية، الهجرة الظهاريَّة، قناة السمع الخارجية، الاطباء الممارسون، اطباء الانف والاذن والحنجرة، الطلاب

Introduction

Cerumen (earwax) is a rich biological substance that occurs naturally in the ears of humans and many other mammals. However, cerumen is the primary cause of ear obstruction [1]. Ceruminous glands (subcutaneously found in the outer ear canal) and sebaceous glands secrete cerumen, which is a mixture of sweat secretions and fatty material [2, 3]. Chemically, cerumen is composed of fatty acids, cholesterol, fatty acids, wax esters, alcohols, cholesterol precursors, immunoglobulins, and ceramides [4]. Cerumen provides the ear with a natural barrier against water and insects, which reduces the incidence of infection [5], and acts as a cleanser and lubricant of the skin and inner part of external ear canal [6]. Additionally, cerumen possesses bactericidal power, which helps to keep the ear free of infections due to the

presence of lysosomes, immunoglobulins, glycoproteins, and lipids [7], in addition to an acidic pH that provides additional protection against microorganisms [8].

Cerumen is regularly removed from the ear through natural jaw movement, along with dirt, dust, and any particles trapped in the cerumen, without any external effort in a process called the conveyor belt or ear self-cleaning mechanism [9]. The conveyor belt is a mechanism of epithelial migration from the tympanic membrane (TM) to the external auditory axis, and is an important self-cleansing property as it provides the ear with an appropriate mechanism to protect these structures from damage, while also maintaining this passage clear for conduction of sound [10]. Epithelial migration plays a role in removing debris and keratinizing squamous epithelium, as well as repairing various injuries to the TM. During the migration of epithelial cells, they desquamate and combine with apocrine and sebaceous gland secretions to form cerumen in the ear canal [11]. Therefore, epithelial migration transports the cerumen from the TM towards the external ear canal opening [12].

Failure of the ear's self-cleaning mechanism to remove excess cerumen in some cases may lead to cerumen impaction [5, 13], which can cause blocking of the ear canal, and symptoms such as hearing loss, tinnitus, discharge, and itching [4, 5, 14]. However, not all subjectively blocked or itching ears are related to cerumen impaction [15]. Nevertheless, when cerumen accumulates enough to cause these symptoms, professional intervention should be considered for its removal [16]. Additionally, cerumen impaction is considered problematic for physicians, as it can hamper diagnoses by preventing complete evaluation of the external auditory canal and TM [10, 17, 18], and consequently it needs to be removed. Cerumen impaction affects 6% of people and its incidence increases in young adults [19] and with aging [20]. Cerumen removal is the most popular otolaryngological practice performed in primary care [21]. In the USA, approximately 12 million people seek medical care for cerumen impaction every year, and approximately 8 million cerumen removal procedures are performed annually [22].

To address symptoms caused by cerumen impaction, some individuals attempt to clean their ears themselves, inserting different tools to remove the cerumen [23]. This is further promoted by other misconceptions, such as that cerumen cleaning is an indicator of good hygiene and that removal of excess earwax is important for better ear function [24]. However, when an untrained person attempts to remove cerumen by means of tools such as cotton buds

or matchsticks, different complications can arise that affect the ear's self-cleaning process. These complications include cerumen impaction, injuries [24, 25], or otitis externa, which increase the risk of hearing loss. One percent of all visits to ear clinics is due to otitis externa, which is considered the most common cause of ear infection; it is mainly caused by unprofessional cleaning of the ear [26, 27].

Increasing public knowledge about the importance of natural cerumen, of the ear's self-cleaning mechanism, and of the danger of cerumen removal by an untrained individual may help to reduce the incidence of these complications and improve aural health care [23]. Otolaryngologists and general medical practitioners play a major role in improving this knowledge through educating their patients. Therefore, it is important that medical students should have sufficient knowledge about cerumen. Thus, in this study, we assessed the knowledge of cerumen and awareness of the ear's self-cleaning mechanism, as well as related ear cleaning practices, among medical students at Al Imam Mohammad Ibn Saud Islamic University, Saudi Arabia. Specifically, we investigated whether there is a difference in this knowledge between preclinical and clinical years students, and between sixth-year medical students (who have taken an otolaryngology course) and fourth and fifth-year students; and also whether knowledge and ear cleaning practices differed between male and female students.

Methods

Study Design

This cross-sectional study was conducted at Al Imam Mohammad Ibn Saud Islamic University, Saudi Arabia. Data was obtained through a questionnaire survey.

Study Subjects

This study included medical students of Al Imam Mohammad Ibn Saud Islamic University who agreed to complete the questionnaire. The random sampling technique was used to select participants from students in year 2 to year 6. Students from other universities, lecturers and employees of the university, students who refused to complete the questionnaire, first year preparatory students, and medical student interns were excluded.

Data Collection

This study used a pre-designed, English language, self-administered questionnaire with a cover letter explaining the purpose of the study. The questionnaire was randomly distributed using online techniques, such as the WhatsApp application, to stu-

dents in years 2 to 6. The questionnaire first asked demographic information and asked if each participant had completed an otorhinolaryngology course. They were also asked if they cleaned their own ears, which tools they used for this, and the reasons behind their habit. The next group of questions assessed their level of knowledge, using 15 true and false questions. Each correct answer was awarded 1 point; therefore, the total score of this section was 15. Students were considered to have good knowledge if they had scores ≥ 66%, while a score of < 66% was considered to indicate poor knowledge, as also previously reported [22]. The demographic data included age, gender, medical year, and nationality.

Data Management and Analysis Plan

Data analysis was performed using IBM SPSS version 22 (IBM Corp., Armonk, NY, USA). Descriptive statistics were calculated for all study variables, and included measures of prevalence, means, standard deviation, and shape of distribution. Moreover, correlations and P-values were calculated to describe any relationship between demographic factors and knowledge. Significance was set at $P < 0.05$.

Ethical Considerations

The protocol used in this cross-sectional study was approved by the Ethics Committee at King Fahad Medical City (IRB Log Number: 20-367E). All study participants provided written informed consent after receiving an explanation of the aims of the study and were provided assurance that their responses and identity would be kept confidential. No reward was offered for completing the questionnaire.

Results

The questionnaire was delivered to a randomly selected sample of 814 medical students. Of these, 708 students (response rate = 86.9%) completed the survey (Table 1). In order to test the reliability of the questionnaire, we calculated Cronbach's alpha coefficient of the questionnaire, which in this case was 0.619. The age of the sample ranged from 18 to 26 years. A majority (73%) were aged between 21 to 25 years, while 27% were between 26 and 30 years, and only 1% were older than 26 years.

Table 1. Distribution of responses per year

	Clinical	Male	Female	TOTAL
Second year	Preclinical years	97	64	161
Third year	Preclinical years	89	74	163
Fourth year	Clinical years	63	62	125
Fifth year	Clinical years	90	45	135
Sixth year	Clinical years	92	32	124
Total		431	277	708
		73 Male students	33 Female students	

The proportion of males was markedly higher than that of females (males 61%; females 39%) (Table 2), and the total number of female students in each medical year was smaller than the total number of male students. Most students in this sample study were in their second year (24.3%) or third year (21.5%); while 18.9% of them were in their fifth year, 17.8% in their fourth year, and 17.5% in their sixth year (Table 2).

Table 2. Demographic distribution.

		Frequency	Percent
Age (years)	18–20	188	26.6
	21–25	513	72.5
	> 26	7	1.0
	Total	708	100.0
Gender	Male	431	60.9
	Female	277	39.1

Regarding the ear's self-cleaning mechanism, 51% of the participants stated that they had heard about it before this study, while 49% had not. Overall, 80% had not yet completed an otorhinolaryngology course, while 20% had completed such a course. Moreover, 64% had a habit of cleaning their own ears (Table 3).

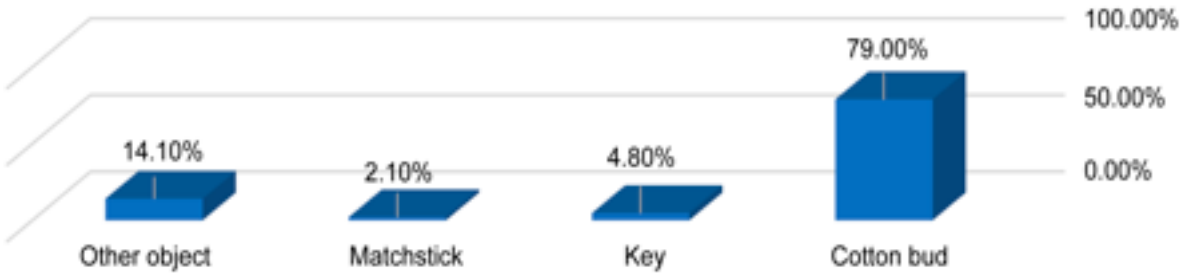
Table 3. Awareness of ear self-cleaning mechanisms.

		Frequency	Percent
Did you hear about self-cleaning mechanisms for the ear before?	YES	362	51.1
	NO	346	48.9
Did you complete an otorhinolaryngology course?	YES	140	19.8
	NO	568	80.2
Do you usually practice ear self-cleaning?	YES	453	64
	NO	255	36

In the next part of the questionnaire, we sought to elucidate the reasons for and the object(s) they used for cleaning their own ears; students who did not clean their own ears did not need to complete this part of the questionnaire. As shown in Figure 1, cotton buds were the tools most commonly used by students to clean their own ears

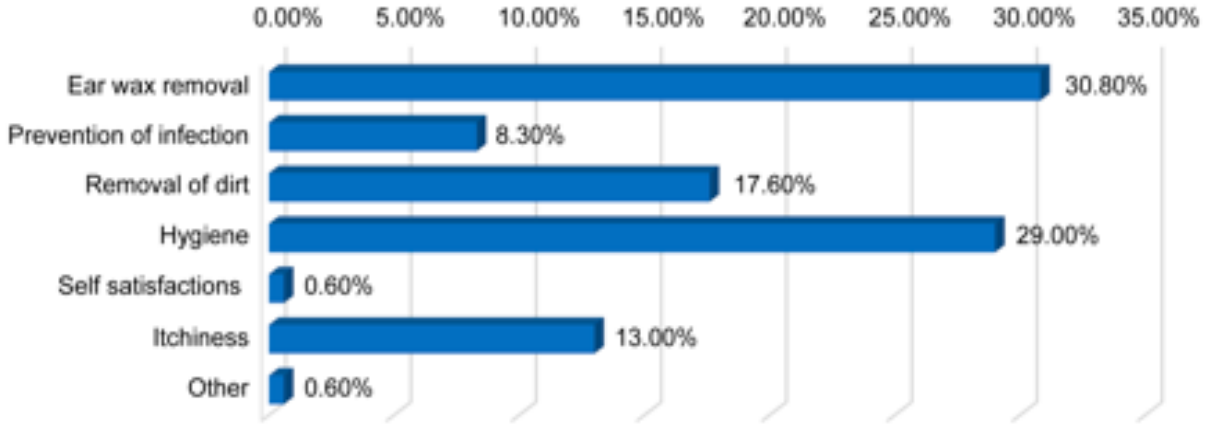
(n = 559, 79%), while 4.8% (n = 34) used a key, 2.1% (n = 15) used a matchstick, and 14.1% (n = 100) used various other objects.

Fig. 1. objects used most commonly to clean your ears.



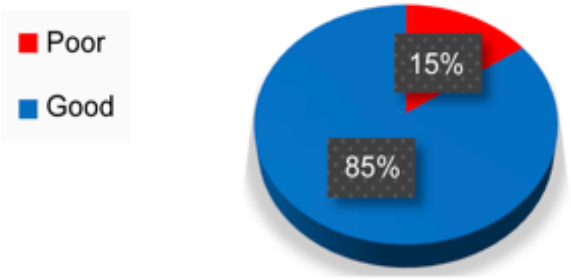
Ear-wax removal was the most common reason for students to clean their own ears (n = 219, 31%). Other reasons included hygiene (n = 205, 29%), removal of dirt (n = 127, 18%), self-satisfaction (n = 4, 0.6%), to relieve itchiness (n = 92, 13%), and because they thought it would prevent ear infection (n = 57, 8.3%) (Figure 2).

Fig. 2. The most common reasons for cleaning your ears.



In the next part of the questionnaire, we assessed the level of knowledge about ear self-cleaning mechanism. We found that 85% of students had good knowledge of this topic, while 15% had little knowledge about this (Figure 3).

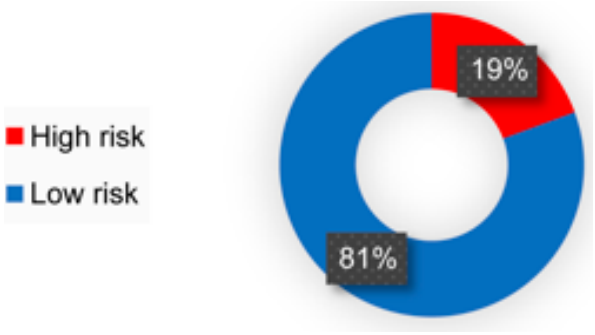
Fig. 3. Level of knowledge



Furthermore, we found that 81% of students had high-risk practices for cleaning

the ear, while 19% did not (Figure 4).

Fig. 4. Risk of practice



The high-risk population represented those who answered < 66% of questions related to cleaning practices correctly, indicating they had less information about the dangers of improper cleaning habits, thus making them at higher risk of using those practices. As shown in Table 4, 59% of students with good knowledge were male, while women represented 26% of students with poor knowledge. In general, gender had a significant effect on participants' knowledge about the ear self-cleaning mechanism (P = 0.003). Moreover, 22% of students with good knowledge were second-year students, while third- and fifth-year students each accounted for 20%, and fourth-year students represented 18% of such students. Moreover 65% of students in preclinical years had poor knowledge about ear self-cleaning, while 57.7% of students in their clinical years had a good level of knowledge. When we compared knowledge between students in preclinical years and those in other years, the preclinical student represented the highest percentage of students with good knowledge (42.3%), followed by the fifth-year (20%), sixth-year (19.6%), and fourth-year students. The college years has a significant effect on participants' knowledge about ear self-cleaning (P = 0.001).

The study also assessed the effect of the otolaryngology course, which is given to sixth-year students, where students who had finished this course represented 19.6% of those with good knowledge and 5.6% of those with poor knowledge, while students who did not finish the course represented 80.4% of those with good knowledge and 94.4% of those with poor knowledge. Generally, it seemed that the otolaryngology course had a significant effect on the level of knowledge (P = 0.001).

Table 4. Level of knowledge.

		Poor Knowledge	Good Knowledge	P-value
Gender	Male	73.8%	58.6%	0.003*
	Female	26.2%	41.4%	
College years	2nd	36.4%	22.1%	0.001*
	3rd	29.0%	20.1%	
	4th	15.9%	18.1%	
	5th	13.1%	20.0%	
	6th	5.6%	19.6%	
	Preclinical	65.4%	42.3%	0.001*
	Clinical	34.6%	57.7%	
Finishing ENT course	6th finished the course	5.6%	19.6%	0.001*
	Other students who did not finish the course	94.4%	80.4%	

*significant at P-value < 0.05
ENT: ear, nose, and throat

Discussion

In this study, we evaluated the level of knowledge of cerumen and the ear's self-cleaning mechanism, as well as habits related to cleaning of own ears among medical students in Al Imam Mohammad Ibn Saud Islamic University, Saudi Arabia. Most students had a good level of knowledge (85%). Gender and college year had an effect on the level of knowledge; females had a higher level of knowledge than males, and students in later college years had a higher level of knowledge, particularly sixth-year students who had completed the otolaryngology course, over preclinical years and other clinical year students.

In general, 79% of students thought that cerumen should be removed regularly as it should not be in the ear, while 63.3% of them considered that cotton buds could be safely used at home. However, 93.4% agreed that cleaning one's own ears at home could cause ear injuries. Nevertheless, about two-thirds of the sample (64%) commonly cleaned their own ears with cotton buds (79%), typically to remove cerumen (31%), while hygiene, removal of dirt, and itching was the reason for this practice in 29%, 18%, and 13% of cases, respectively.

Many studies have evaluated the level of knowledge about cerumen and the practice of cleaning of the ear. Gabriel et al. found that 22.5% of medical school par-

ticipants knew that cotton buds can cause complications, while 44.9% knew that it could cause damage; nevertheless, they found that 61.2% of students reported the usefulness of using cotton buds; this is similar to our results [28]. Aldawsari et al. conducted a cross-sectional study among medical students of Majmaah, Kingdom of Saudi Arabia, that included 258 students from the second to sixth year in a college of medicine, and used a questionnaire to assess knowledge, attitude, and practice related to cleaning their own ears; although this study was limited in its small sample size when compared to our study [23]. They found that 44.6% of their sample had good knowledge, while more than half of the sample had poor knowledge. However, they did not find any significant relationship between college level and level of knowledge [23]. Afridi et al. in 2016 had conducted a cross-sectional study among 250 randomly selected medical students from all years of a medical college in Peshawar, Pakistan. They found that 48% of the study sample were aware about complications related to using cotton buds, while 7.6% of students had suffered pain, 0.8% pus, and 2.4% ear discharge due to usage of cotton buds [29]. Other studies also indicated that approximately 90% of participants in their questionnaire thought that ears should be cleaned regularly and indicated that they regularly cleaned their own children's ears [8].

In contrast to our study, Khan et al. did not find a significant correlation between gender and the practice of ear cleaning [30]. However, in Aldawsari et al.'s study, gender had a significant effect on the overall knowledge of participants, where females seemed to have a higher level of knowledge than males, in line with our results[23]. Moreover, in our study, students at higher college levels had higher levels of knowledge, possibly because older students are more likely to have completed their otorhinolaryngology course, which seemed to improve students' knowledge significantly. This otolaryngology course aims to provide the students with the knowledge and skills that enable him/her to identify, analyze, manage, and/or refer clinical common ear, nose and throat (ENT) problems in order to provide efficient, cost-effective, and humane patient care; in addition to teaching them principles of prevention and management of common and life-threatening ENT conditions, including the importance of cerumen and risks of ear cleaning. Therefore, this study shows that this type of course has an important role in improving the knowledge of medical students about cerumen and ear cleaning mechanisms. In contrast, Aldawsari et al. did not find any significant relationship between college

level and level of knowledge [23].

Previous studies showed that hygiene, dirt removal, and relief of itching are the most common reasons for cleaning the ear; however, they differed in terms of the most common reason [31, 32]. Previous studies also differed in terms of the prevalence of using cotton buds: in a study conducted in England, the prevalence of using cotton buds was 68% [20], while in Kaduna, it was 90%, and in Osun, it was 44.9% [33]. Khan et al. [30] investigated self-ear cleaning practices in undergraduate students at KwaZulu-Natal University and found that 98% had engaged in self-ear cleaning and 75% indicated that this habit was beneficial. Cotton buds were the most common methods used in self-ear cleaning (79.6%). This usage of cotton buds was associated with an injury rate of 2.4% [30]. Aldawsari et al. showed that cotton buds were the most common tools used in self-ear cleaning (65.5%), while hygiene was the most common reason for this habit; they also found that 88.2% of students had low-risk practices (they correctly answered ≥ 66% of questions related to practicing) [23]. Other studies indicated that ear wax removal was the most reason for using cotton buds [4, 31, 32, 34].

Our study had some limitations. First, the study was performed at a single institution; therefore, the results may not be generalizable. However, this study extends research performed at another Saudi Arabian university [23]. Furthermore, the study involved self-reporting via a questionnaire, which may entail bias. Finally, Cronbach's alpha, although acceptable, was not high, which reduces the reliability of the questionnaire. Nevertheless, this questionnaire was used in another study to assess the same variables as our study however they had a limitation of small sample size that was modified in ours [24].

Conclusion

In this study, we found that there is a gap between knowledge and practice among medical students. While medical students had a good level of knowledge of cerumen, many of them were regularly cleaning their own ears primarily using cotton buds, despite knowing that it could harm ear function. Moreover, this study, in contrast to previous studies, found that completion of an otolaryngology course had marked effects on the development of this knowledge. Females had higher levels of the relevant knowledge than males. Therefore, there is a need to identify methods that can encourage these students to avoid self-ear cleaning practices, particularly among male students who have not completed the otolaryngology course. We rec-

ommend that more awareness programs and workshops be implemented to increase knowledge, particularly for preclinical male students. Further investigations at other universities in the Kingdom of Saudi Arabia are necessary in order to be able to generalize the results.

Conflict of interest:

None

Financial support:

None

Unblinded ethics statement

The protocol used in this cross-sectional study was approved by the Ethics Committee at King Fahad Medical City (IRB Log Number: 20-367E).

Availability of data and materials

All data available on request.

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Original article :

Perceptions and satisfaction of Faculty towards Quality Unit: College of Medicine, Majmaah University, Saudi Arabia

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Abstract

Background and Aims:
The degree of faculty members' satisfaction is one of the mechanisms used in assessing the quality of Education services. This research aims to assess faculty members perception and satisfaction towards activities of the quality unit in the college of Medicine, Majmaah University, Saudi Arabia.

Methods:
This research was cross-sectional study to assess perception and satisfaction of faculty' members towards Quality Unit in College of Medicine, Majmaah University. Systematic sampling was considered in the study and sample size was taken as 49. A pre-tested and validated questionnaire was used for data collection. Data analysis was performed by SPSS.

Results:
48 (97.9% of the staff stated that quality unit efforts

الملخص

خلفية:
تعتبر قناعة أعضاء هيئة التدريس من المعايير التي تستخدم لقياس الجودة في التعليم العالي. تهدف هذه الدراسة الى تقييم إدراك أعضاء هيئة التدريس ورضاهم عن أنشطة وحدة الجودة في كلية الطب بجامعة المجمعة بالمملكة العربية السعودية.

طريقة البحث:
هذه دراسة مقطعية لتقييم إدراك ورضاء أعضاء هيئة التدريس تجاه وحدة الجودة في كلية الطب، جامعة المجمعة. تم أخذ العينة عن طريق العينة العشوائية المنتظمة حيث بلغ حجمها تسعة وأربعون من الجنسين. تم جمع البيانات عن طريق استبيان تم اختباره مسبقًا وتم إجراء التحليل عن طريق برنامج الحزم الإحصائية للعلوم الاجتماعية.

النتائج:
ذكر ٤٨ (٩٧,٩٪) من أعضاء هيئة التدريس أن جهود وحدة الجودة بالكلية واضحة ومؤثرة. بلغ متوسط إدراك أعضاء هيئة التدريس لجهود وحدة الجودة ٨٨٪. بلغ متوسط الإدراك تجاه أنشطة وحدة الجودة الموجهة لأعضاء هيئة التدريس (٩٥,٢٪). أوضحت النتائج أن ٣٥,٤٪ و٤٧,٩٪ من أعضاء هيئة التدريس كانوا راضين للغاية

are influential and recognized. The mean perception of faculty towards quality unit was 88%. The mean perception towards quality unit activities directed to faculty was (95.2%). Results showed that 35.4% and 47.9% of the faculty were very highly and highly satisfied with the quality unit in the college.

Conclusion:
Faculty are highly satisfied with the quality unit performance. Perception of most faculty towards quality unit activities is high. Support of the quality unit to the faculty was acknowledged by most of them.

Key Wards:
Perception, Quality, Faculty, Majmaah University

عن اداء وحدة الجودة بالكلية.

الخلاصة:
أعضاء هيئة التدريس راضون للغاية عن أداء وحدة الجودة بالكلية كما أن إدراك معظم أعضاء هيئة التدريس لنشاطات وحدة الجودة مرتفع. دعم وحدة الجودة بالكلية لأعضاء هيئة التدريس مقدر من قبل معظمهم.

Introduction:

The World Bank stated that in the context of globalization, the quality of higher education (HE) is significantly considered as highly important for the national economic development [1] .Quality management is a recent phenomenon important for both organizations and clients [2-5]. Every quality expert defines the term differently. Definitions vary between academicians and services, between industries and practitioners. Definitions vary just because of the intangible nature of the components associated with quality [6-8].

Quality in higher education is defined as "the set of activities that should lead to the identification of sources that cause problems or defects in the educational process, and to deal with these sources to avoid problems or defects in the educational process before they actually occur" [9]. It is a way of describing the extent that available learning opportunities for students assist them to fulfil their objectives. It is about getting sure that effective and appropriate teaching, technical support, assessment and learning opportunities are insured for them [10].

The quality of teachers shows a stronger relationship [than school facilities and curricula] to student achievement. Furthermore, it is progressively greater at higher grades, indicating a cumulative impact of the qualities of teachers in the college on the student's achievements [11].

Public expenditure per HE student has not kept pace, Indeed, while enrolments and overall spending have increased [12-14].

Labor markets are not responding to the dynamic expansion of HE systems, so graduate unemployment has become a major concern particularly in developing countries. Therefore, there is a general perception of declining academic standards and a questioning of the relevance of HE to labor market needs [15-17]. To address these concerns, many countries have created mechanisms for external quality assurance (EQA), such as accreditation and review or quality audit [18].

Medical colleges all over the world is adopting quality measures and standards through quality units to meet accreditation standards. The primary objective of accreditation and quality improvement is to adjust medical education to changing environment in the healthcare delivery system, to prepare high quality graduates that fulfil the needs and expectations of the community, to help graduates cope with the explosion in scientific knowledge and technology, and inculcate in them the desire for lifelong learning [19-22] .

Accreditation was not existed in KSA until the year 2004. The National Commission for Academic Assessment and Accreditation (NCAAA) was introduced in 2005. All institutes of higher education are to be accredited by the NCAAA. The NCAAA has developed a comprehensive quality assurance and accreditation system that benefited from international experience while keeping its national features and characteristics. NCCAM responsibilities include establishing standards, criteria and procedures for accreditation, reviewing and evaluating performance of existing and new institutions, accrediting institutions and programs, and supporting improvements in quality [23-26].

High Quality in education is a target for Majmaah University to graduate high quality graduates to the labor market in Saudi Arabia and the whole world. College of Medicine is one of the programs in Majmaah University that was applied and working to acquire the National Accreditation. The quality unit in College of medicine is leading activities of quality following the guidelines of the NCAAA.

The current aims at study assessing faculty perceptions towards the quality unit in college of Medicine, Majmaah University activities and its role in supporting faculty, and to assess faulty satisfaction towards the unit.

Methods:

This was a descriptive study to assess perception and satisfaction of faculty

members, college of Medicine, Majmaah University towards the quality. All faculty members in the college were included. Faculty who were in academic assignments and teaching assistance were excluded from the study. Systematic random sampling was used, and sample size was calculated as 49.

The questionnaire was developed from the measurement and evaluation form of the Deanship of Quality and Skills Development, Majmaah University. The questionnaire was tested on the staff members of the College of Dentistry, Majmaah University. Cronbach's alpha was employed to ensure reliability. Data were analyzed by SPSS software, version 23. Descriptive statistics were used. The ethics approval was obtained from Majmaah University IRB.

Results:

Table (1) shows Perception of faculty towards quality unit performance. Forty-eight (97.9%) of the faculty agreed that quality control unit efforts are influential. For clarity of the quality control unit duties for the faculty, 44 (90%) of faculty agreed that duties were clear. Thirty-two faculty (64.6%) agreed that the effect of the unit efforts is tangible. Forty-seven faculty (95.8%) agreed that activities of the unit were well implemented. In response to Unit is active with noticeable positive impact question, 91.6% agreed to the statement. The mean score for good Perception of faculty towards Quality Control Unit performance was 88%.

Table (1) Perception of faculty towards Quality unit n=49

Variable	Response	
	Agree	Disagree
Efforts are influential and recognized	48 (97.9)	1 (2.1)
Duties of the members are clearly defined	44 (90)	5 (10.0)
The effect of the efforts is tangible	32 (64.6)	17 (35.4)
Activities are well implemented	47 (95.8)	2 (4.2)
Unit is active with noticeable positive impact	45 (91.6)	4 (8.4)
Mean	43 (88)	6 (12.0)

Table (2) shows perception of faculty towards Quality Control Unit activities. In response to the question: the unit provides high quality technical support to faculty, 46 (93.7%) agreed to the statement. Quality control unit plays an important role in increasing the awareness about quality control measures, 48 (98%) agreed to the statement. Forty-six (93.7%) faculty agreed that workshops provided by the unit fulfill faculty requirements. Forty-seven (95.8%) of faculty agreed that here is dynamic communication between quality control unit and faculty members.

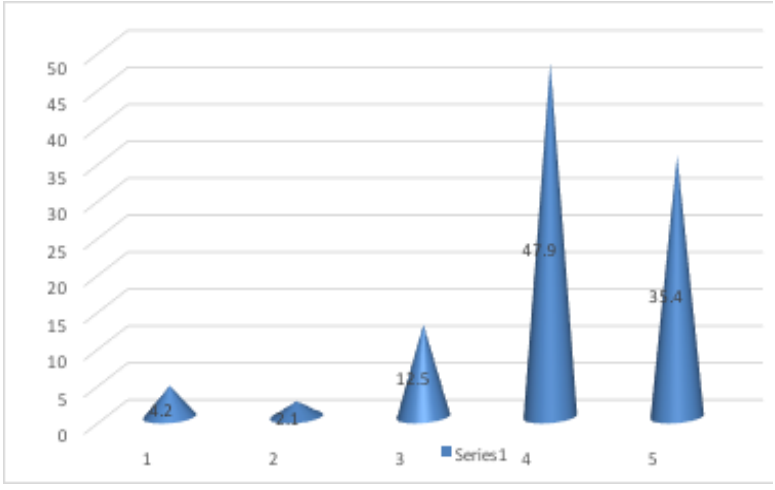
The mean good level of faculty towards Quality Control Unit activities was 95.2%.

Table (2) Perception towards Quality unit activities directed to faculty (n=49)

Variable	Perception towards activities	
	Agree No. (%)	Disagree No. (%)
High quality technical support is provided	46 (93.7)	3 (6.3)
Play an important role in increasing the awareness about quality control measures	48 (98)	1 (2)
Workshops provided by the units fulfill faculty members requirements	46 (93.7)	3 (6.3)
There is dynamic communication between quality control unit members and faculty members	47 (95.8)	2 (4.2)
Mea	47 (95.2)	2 (4.2)

Fig (1) shows satisfaction about the performance of the quality control unit in the college, 35.4% of the faculty were very highly satisfied, 47.9 were highly satisfied, 12.5% were moderately satisfaction, 2.1% were not satisfied and 4.2% were extremely not satisfied.

Fig. (1) Satisfaction about the performance of the quality in the college (n=49)



Discussion:

Deanship of quality in Majmaah University plays a big role in the development of the system of quality based on NCAAA standards and plays a major role in supporting quality management units. Most of the faculty admitted that the quality unit

efforts are recognized and tangible. They also stated that the standards of the quality process are clear. These findings are consisted with Al Saud AS et al in the Faculty of Arts at King Saud University, KSA [27]. Our results show that duties and activities of the quality unit are clear and well implemented, the unit has a positive impact on quality progress. These factors are so important, Manghani K and Al Mohaimeed A et al stated that these factors help achieve success by assisting the achievement of high-quality procedures and enhancement of satisfaction [28,29].

Most of the faculty admitted that the quality unit provides its services including training to faculty members in an organized manner, reviewing the course reports and course specifications along with reviewing exam questions. This finding consists with Al Saud AS et al who stated that the Quality Unit provides training opportunities using modern technology and takes into consideration faculty members' needs [27]. This finding agrees with Al Mohaimeed, who stated that Educational resources such as textbooks and e-learning materials are provided along with the orientation workshops for newcomers. He also stated that workshops are provided by the faculty development unit which was given the responsibility to develop training programs to enhance the teaching and research skills[28].

Concerning assessment of faculty satisfaction, results shows that 83.3% were very highly and highly satisfied about the performance of the quality in the college. These findings are in line with study done in Qassim College of Medicine [29] .

The study concluded that: Faculty are highly satisfied with the quality unit performance. Perception of most faculty towards quality unit activities is high, its support was acknowledged by most of the faculty.

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Original article :

Association between Smartphones Addiction and Neck Disability among Private Universities Students in Riyadh.

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Abstract

Background and Aims:
Repeated and prolonged use of smartphones will have negative impacts on the human body. In talking about musculoskeletal problems, many studies found a relationship between neck disabilities and smart devices usage. Our study aimed to assess the association between smartphones addiction and neck disability among private universities students in Riyadh.

Method:
This cross-sectional study was conducted among private universities students in Riyadh include medical and non-medical colleges. The participants were given online and direct questionnaire to link the association between smartphones addiction using the problematic use of mobile phones (PUMP) scale and neck disability using the neck disability index.

Results:
The study included 527 participants; the majority of the participants were females (81%) as compared to

الملخص

الخلفية والأهداف:
الاستخدام المتكرر والمطول للهواتف الذكية سيكون له آثار سلبية على جسم الإنسان. في الحديث عن مشاكل العضلات والعظام ، وجدت العديد من الدراسات وجود علاقة بين إعاقات الرقبة واستخدام الأجهزة الذكية. هدفت دراستنا إلى تقييم العلاقة بين إدمان الهواتف الذكية وإعاقة الرقبة بين طلاب الجامعات الخاصة في الرياض.

طريقة البحث:
أجريت هذه الدراسة المستعرضة بين طلاب الجامعات الخاصة في الرياض ، بما في ذلك الكليات الطبية وغير الطبية. تم إعطاء المشاركين استبيانًا عبر الإنترنت ومباشرًا لربط العلاقة بين إدمان الهواتف الذكية باستخدام إشكالية استخدام مقياس الهواتف المحمولة (PUMP) وإعاقة العنق باستخدام مؤشر إعاقة العنق (NDI) .

النتائج:
تضمنت الدراسة ٥٢٧ مشاركاً. غالبية المشاركين من الإناث (٨١٪) مقارنة بالذكور (١٩٪). استخدم ٤٥٪ من المشاركين الأجهزة الذكية لمدة ٧ ساعات وما فوق ، متبوعين بـ (٤١,٢٪) الذين كانوا يستخدمونها بين ٤-٦ ساعات و ١٤٪ فقط من المشاركين كانوا يستخدمونها بين ١-٣ ساعات. لوحظ وجود إعاقة كبيرة في الرقبة عند المشاركين الذين كانوا يستخدمون الشاشة لمدة ٧ ساعات وأكثر

males (19%). Forty-five percent of the participants were using smart devices for 7 hours and above, followed by (41.2%) who were using it between 4-6 hours, and only 14% of the participants were using them between 1-3 hours. A significant higher neck disability was noticed in participants who were using the screen for 7 hours and more (p=0.015).

Conclusion:
The study concluded that the majority of university students are using smartphones for 7 hours and more. This finding was significantly associated with the development of neck disability.

Keywords:
Smartphones; Addiction; Neck Disability; University students; Saudi Arabia.

(٠,٠١٥ = p)

الخاتمة:
اوضحت الدراسة إلى أن غالبية طلاب الجامعات يستخدمون الهواتف الذكية لمدة ٧ ساعات فأكثر. وجدت هذه النتيجة مرتبطة بشكل كبير بتطور إعاقة الرقبة..

الكلمات الرئيسية:
الهواتف الذكية. إدمان؛ إعاقة العنق طلاب الجامعة؛ المملكة العربية السعودية.

Introduction

In the last few years, smartphones, and electronic devices (e-devices; smartphones, computers, and others) have been become widely spread among many communities and across all ages. Modern people use a smartphone in most areas of their lives, including occupational and leisure activities, which means their duration of smartphone usage is also increasing [1]. Recent estimates showed that at least 77% of the world's population has its own mobile phone [2]. The excessive use of smartphones to a level where it interferes with the daily lives of users is thus considered to be smartphone addiction [3].

Regarding musculoskeletal problems, many studies found a relationship between neck disabilities and smart devices usage. For instance, in a study carried out in Korea in 2016, they found a significant correlation between neck flexion angle and posture while using the smartphone [4]. Moreover, a study from India conducted on university students in 2018 shows the repetitive and continuous neck flexion posture considered as a high risk of chronic neck pain, which explains the strong association between smartphone addiction and neck disability[5]. In another study in Saudi Arabia, there was a positive association between smartphone addiction and neck problems [6]. This pain is most proba-

bly explained by the inappropriate posture while using the smart device as the person bends his or her neck more on purpose of looking to a small screen [7]. In addition, as a normal response to keep the neck in balance, the extensor muscle activated more, which increases the load on the cervical erector spine and trapezius muscle [8]. Another study in Korea found out that smartphone usage produces chronic neck pain and severe upper back muscle spasm by reducing cervical lordosis and the pain threshold of the neck muscles. Also, it causes shoulder pain and tightness, resulting in painful shoulder muscle spasm [9]. Although this correlation remains controversial, as another study found that there is no correlation between neck pain and the time spends on smartphone usage [10].

On the other hand, there is a study in Saudi Arabia conducted in 2018 found that there is a positive correlation between long-time smart devices usage and neck pain, specifically for those who spend 5-8 hours a day on smart devices [11]. According to a study in Korea in 2016, when they evaluated 34 respondents of adult individuals and divided them into three groups with different duration of smartphone usage as group 1 for 10 minutes, group 2 for 20 minutes and group 3 for 30 minutes; showing a direct proportion between neck pain and duration, so the neck pain increases when the duration of the smartphone usage gets longer [12]. Another study conducted in Saudi Arabia finds out that nearly one-third of the students who complained of neck pain symptoms showed significant associations with female gender 44% in comparison with only 29% of male whose use smartphone either for study or leisure purposes [13]. Another study in Shanghai showed high prevalence neck/shoulder pain significantly more in females (44.5%) compared with males (36.8%) this is closely related to multiple factors including digital products, physical activity, and psychological status [14].

This study aims to measure the usage of smartphones among students studying in private universities in Riyadh and identify the negative effects and consequences in their life, particularly neck disabilities.

Methodology

This was a cross-sectional study by design and was carried out on a representative sample of students from private universities in Riyadh including medical and non-medical colleges, from the period of January to August 2019. We targeted females and males from private universities students in Riyadh city, Kingdom of Saudi Arabia. We expected a high response rate; however, we eliminated all invalid, in-

complete responses, or any responses that did not match the inclusion criteria with a total of 270 participants. Our sample size included 500 university students, including both females and males. The sample size derived based on computing the minimum sample size required for accuracy in estimating proportions by considering the normal standard deviation set at 95% confidence level (1.96), percentage picking a choice or response (50% = 0.5) and the confidence interval (0.05 = ±5) [15]. The formula is n=(z^2 (p)(1-p))/c^2 where,

z = standard normal deviation set at 95% confidence level

p = percentage picking a choice or response

c = confidence interval

Putting the values in the above formula yielded a minimum sample size of 384. However, for more precise results we increased the sample size to (500) including those who match the eligibility criteria which was 1(must be a university student 2) aged 18 years and above 3(regularly using the smartphones 4) no blindness or vision loss 5(no mental disability 6) No paralysis or physical disabilities.

Validated questionnaires were used to collect the data from study subjects; the data was collected by trained students using online and direct methods. The first part of the questionnaire contained sociodemographic data, whereas the second part contains 1) the Arabic version of the problematic use of mobile phones (PUMP) scale. The PUMP scale is a 20-item questionnaire that assesses mobile phone use based on the DSM-5 criteria for substance use disorder [16, 17]. The original English language PUMP scale score was compared to other scores of smartphone addiction and showed a convergent validity and excellent internal consistency. The PUMP scale score was positively correlated with excessive smartphone usage and the self-report feelings of addiction. All items were rated on a 5-point scale ranging from 1 = "strongly disagree" to 5 = "strongly agree" [17]. The Arabic version of the PUMP scale score was previously used in a study conducted in Saudi Arabia among university students. The Arabic version was validated by experts in psychiatry and addiction, and reliability tested as well. [16].(2) the neck disability index (NDI), which is a modification of the Oswestry Low Back Pain Disability Index [18]. Validity was ensured through peer-review and patient feedback sessions. Test-retest reliability was determined by using the correlation coefficient and Pearson's correlation analysis. For the determination of concurrent validity was assessed in two ways. First, on a smaller subset of 10 patients who completed a course of conservative care, the percentage of change on NDI scores before and after

treatment was compared to visual analog scale scores for perceived improvement in activity levels. These scores correlated at 0.60. Secondly, in a larger subset of 30 subjects, NDI scores were compared to scores on the McGill Pain Questionnaire, with similar moderately high correlations (0.69-0.70). While the sample size of some of the analyses is somewhat small, this study demonstrated that the NDI achieved a high degree of reliability and internal consistency.[19].

Ethical Considerations:

The study was reviewed and approved by the ethical committee at Dar Al Uloom University, Riyadh, Saudi Arabia. The participants informed that all the collected information for statistical analysis only and their consents have obtained.

Data Analysis:

The collected data was entered and analyzed using the Statistical Package for the Social Science (SPSS Inc. Chicago, IL, USA) version 23. Descriptive statistics were calculated. Percentages are reported for qualitative variables. Fisher Exact test was applied to observe associations between qualitative variables. One-Way-Analysis was applied to compare the PUMP score with Neck Disability Syndrome. Post-Hoc Tukey test was also applied to observe significant multiple comparison differences. A p-value of < 0.05 was considered statistically significant.

Results

The majority of the participants n=465 (88.2%) belonged to the age group of 18-25 years, followed by n=43 (8.2%), who belonged to the age group of 26-33 years. A few numbers of respondents n=19 (3.7%) were from the age group of 34-55 years. The major chunk of the participants was females n=427 (81%) as compared to males n=100 (19%). Most of the participants were single n=449 (85.2%), around 14% were married, and a small percentage were divorced and widowed.

Table 1: Educational characteristics and smart devise usage of participants (n=527)

	n (%)		n (%)
University		Academic Level	
DAU	240 (45.5)	1st – 2nd	97 (18.4)
AMU	101 (19.2)	3rd – 4th	96 (18.2)
PSU	60 (11.4)	5th – 6th	62 (11.8)
IMC	34 (6.5)	7th – 8th	70 (13.3)
AU	33 (6.3)	9th – 10th	66 (12.5)
REU	31 (5.9)	11th – 12th	47 (8.9)
FC	12 (2.3)	13th – 14th	76 (14.4)
Others	5 (0.9)	Master	10 (1.9)
YU	4 (0.8)	Ph.D.	3 (0.6)
GC	4 (0.8)		
AOU	3 (0.6)		
Academic Performance		Smart Device	
Excellent	146 (27.7)	Mobile phone	485 (92.0)
Very Good	261 (49.5)	Laptop	25 (4.7)
Good	105 (19.9)	iPad	9 (1.7)
Poor	15 (2.8)	Video game	5 (0.9)
		Desktop computer	3 (0.6)
Hours Spending on using smart devices (hours)		Specialty	
1-3	73 (13.9)	Non-medical	189 (35.9)
4-6	217 (41.2)	Medical	338 (64.1)
7 and above	237 (45.0)		

PUMP: problematic use of mobile phones, NDI: Neck disability index, DAU: Dar Al Uloom University, AMU: AlMaarefa University, PSU: Prince Sultan University, IMC: Inaya Medical College, AU: Alfaisal University, REU: Riyadh Elm University, FC: Al-Farabi College, YU: Al Yamamah University, GC: Al Ghad Colleges, AOU: Arab Open University.

Results presented in Table 1 showed that majority of the participants were studying in DAU n=240 (45.5%), followed by n=101 (19.2%) who were studying in AMU, n=60 (11.4%) in PSU, nearly 6% were studying in REU, AU, and IMC respectively. A few numbers of participants were studying in FC, YU, GC AOU, and others. The academic performance categorized into excellent, very good, good, and poor based on the university grade point average range from 0.00 to 4.00. Excellent performance range from 4.00 to 3.5, very good from 3.49 to 2.75, good from 2.74 to 1.75, and from 1.74 to 0.00 considered poor. Most of the participants were very good n=261 (49.5%), around 28% has excellent performance, one-fifth had good academic performance, and only n=15 (2.8%) had

a poor academic performance. The major chunk of the participants was using smart devices for 7 hours and above, followed by n=217 (41.2%) who were using it between 4-6 hours, and only 14% of the participants were using them between 1-3 hours. The distribution of participants studying in 1st-2nd and 3rd-4th was almost equal (18%) respectively. Around 15% were studying in the 13th-14th year, followed by 7th-8th (13.3%), 9th-10th (12.5%), 9% were studying in the 11th-12th year, around 2% were doing master's and a small number of participants were enrolled in Ph.D. Mobile phone was the most used smart device by the participants n=485 (92%), followed by laptop n=25 (4.7%), iPad n=9 (1.7%) and less than 1% were using a desktop computer and video games. Almost two-quarter of the participants belonged to medical specialty, and one-quarter were enrolled in the non-medical specialty.

Table 2: Association between Neck Disability Syndrome, sociodemographic data and device usage

PARAMETER	NECK DISABILITY SYNDROME						P-value (Fischer Exact Test)
	No n (%)	Mild n (%)	Moderate n (%)	Severe n (%)	Complete n (%)	Total	
Age	148 (87.1)	244 (89.4)	61 (89.7)	9 (75.0)	3 (75.0)		0.197
18-25	14 (8.2)	21 (7.7)	6 (8.8)	1 (8.3)	1 (25.0)	465	
26-33	7 (4.1)	4 (1.5)	0 (0.0)	2 (16.7)	0 (0.0)	43	
34-41	0 (0.0)	3 (1.1)	0 (0.0)	0 (0.0)	0 (0.0)	13	
42-49	1 (0.6)	1 (0.4)	1 (1.5)	0 (0.0)	0 (0.0)	3	
50-55						3	
Total (n)	170	273	68	12	4	527	
Gender	45 (26.5)	49 (17.9)		2 (16.7)			0.005*
Male	125 (73.5)	224 (82.1)	4 (5.9)	10	0 (0.0)	100	
Female			64 (94.1)	(83.3)	4 (100)	427	
Total (n)	170	273	68	12	4	527	
Marital Status	145 (53.7)	232 (85.0)	60 (88.2)	9 (75.0)	3 (75.0)		0.076
Single	25 (19.0)	39 (14.3)	5 (7.4)	3 (25.0)	1 (25.0)	449	
Married	0 (0.0)	2 (0.7)	1 (1.5)	0 (0.0)	0 (0.0)	73	
Divorced	0 (0.0)	0 (0.0)	2 (2.9)	0 (0.0)	0 (0.0)	3	
Widow / Widowed						2	
Total (n)	170	273	68	12	4	527	
Center Screen							0.326
Above	9 (5.3)	17 (6.2)	5 (7.4)	1 (8.3)	0 (0.0)	32	
Lower	100 (58.8)	153 (56.0)	43 (63.2)	11	3 (75.0)	310	
Same Level	61 (35.9)	103 (37.7)	20 (29.4)	(91.7)	1 (25.0)	185	
				0 (0.0)			

Total (n)	170	273	68	12	4	527	
Hours Spending							0.015*
1-3	27 (15.9)	38 (13.9)	5 (7.4)	2 (16.7)	0 (0.0)	72	
4-6	86 (50.6)	108 (39.6)	18 (26.5)	4 (33.3)	0 (0.0)	216	
7 and above	57 (33.5)	127 (46.6)	45 (66.2)	6 (50.0)	4 (100.0)	237	
Total (n)	170	273	68	12	4	527	
*-Statistically significant (P<0.05), n and % – Number and percent of subjects respectively							

The Neck disability was significantly more in females as compared to males (p=0.005). Likewise, neck disability was significantly more in participants who were using the screen for 7 hours and more (p=0.015). No significant association was observed between neck disability and age (p=0.197), marital status (p=0.076), and screen angle (p=0.326). The results are presented in Table 2.

Table 3: Association between Neck Disability Syndrome and Academic data

	NECK DISABILITY SYNDROME						
PARAMETER	No n (%)	Mild n (%)	Moderate n (%)	Severe n (%)	Complete n (%)	Total	P value (Fischer Exact Test)
University	79 (46.5)	122 (44.7)	34 (50.0)	4 (33.3)	1 (25.0)		
DAU	46 (27.1)	50 (18.3)	5 (7.4)	0 (0.0)	0 (0.0)	240	
AMU	8 (4.7)	18 (6.6)	3 (4.4)	2 (16.7)	0 (0.0)	101	
REU	14 (8.2)	34 (12.5)	8 (11.8)	2 (16.7)	2 (50.0)	31	0.001*
PSU	11 (6.5)	14 (5.1)	7 (10.3)	1 (8.3)	0 (0.0)	60	
AU	5 (2.9)	20 (7.3)	7 (10.3)	2 (16.7)	0 (0.0)	33	
IMC	0 (0.0)	3 (1.1)	1 (1.5)	0 (0.0)	0 (0.0)	34	
YU	0 (0.6)	3 (1.1)	0 (0.0)	0 (0.0)	1 (25)	4	
GC	1 (0.6)	2 (0.7)	0 (0.0)	0 (0.0)	0 (0.0)	4	
AOU	5 (2.9)	4 (1.5)	2 (2.9)	1 (8.3)	0 (0.0)	3	
FC	1 (0.6)	3 (1.1)	1 (1.5)	0 (0.0)	0 (0.0)	12	
Others						5	
Total	170	273	68	12	4	527	
Year	28 (16.5)	52 (19.0)	14 (20.6)	1 (8.3)	2 (50.0)		
1^{st} – 2^{nd}	30 (17.6)	48 (17.6)	13 (19.1)	4 (33.3)	1 (25.0)	97	
3^{rd} – 4^{th}	16 (9.4)	37 (13.6)	7 (10.3)	1 (8.3)	1 (25.0)	96	
5^{th} – 6^{th}	16 (9.4)	41 (15.0)	10 (14.7)	3 (25.0)	0 (0.0)	62	
7^{th} – 8^{th}	19 (11.2)	38 (13.9)	9 (13.2)	0 (0.0)	0 (0.0)	70	
9^{th} – 10^{th}	16 (9.4)	23 (8.4)	7 (10.3)	1 (8.3)	0 (0.0)	66	
11^{th} – 12^{th}	38 (22.4)	31 (11.4)	6 (8.8)	1 (8.3)	0 (0.0)	47	0.238
13^{th} – 14^{th}	4 (2.4)	3 (1.1)	2 (2.9)	1 (8.3)	0 (0.0)	76	
Master	3 (1.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	10	
Ph.D.						3	
Total	170	273	68	12	4	527	

Academic Performance							
Poor	4 (2.4)	9 (3.3)	1 (1.5)	1 (8.3)	0 (0.0)	15	
Good	20 (11.8)	58 (21.2)	22 (32.4)	3 (25.0)	2 (50.0)	105	
Very Good	90 (52.9)	138 (50.5)	27 (39.7)	4 (33.3)	2 (50.0)	261	0.076
Excellent	56 (32.9)	68 (24.9)	18 (26.5)	4 (33.3)	0 (0.0)	146	
Total	170	273	68	12	4	527	
Specialty							
Medical	53 (31.2)	101 (37.0)	27 (39.7)	6 (50.0)	0 (0.0)	189	
Non-Medical	117 (68.8)	172 (63.0)	41 (60.3)	6 (50.0)	0 (0.0)	338	0.044*
Total	170	273	68	12	0	527	

PUMP: problematic use of mobile phones, NDI: Neck disability index, DAU: Dar Al Uloom University, AMU: AlMaarefa University, PSU: Prince Sultan University, IMC: Inaya Medical College, AU: Alfaisal University, REU: Riyadh Elm University, FC: Al-Farabi College, YU: Al Yamamah University, GC: Al Ghad Colleges, AOU: Arab Open University.

Results presented in Table 3 showed that most of the participants studying in DAU had significantly more neck disability as compared to participants studying in other institutions (p=0.001). Moreover, participants studying in non-medical disciplines had significantly more neck disability (p=0.044). However, neck disability was not significantly associated with the year of study (p=0.238) and academic performance (p=0.076).

Table 4: Comparison of PUMP score with Neck Disability Syndrome

Neck Disability Syndrome	n	**PUMP Score** (Mean ± S.D)	p-value
No	170	53.28 ± 15.08	
Mild	273	59.36 ± 14.58**	
Moderate	68	65.76 ± 15.23**	
Severe	12	65.25 ± 14.36	<0.001*
Complete	4	73.75 ± 20.83	

*statistically significant at 5% level of significance

**Tukey's test significant multiple comparisons

A significant difference was observed between the PUMP score and Neck Disability (p<0.001). Post-Hoc analysis showed that the PUMP score significantly varies between participants having mild and moderate (p=0.014) neck disability. However, Post-HOC analysis was not statistically significant for PUMP score and patients having no (p=0.654), severe (p=0.056), or complete neck disability (p=0.308). The results are presented in Table 4.

Discussion

This study found that major of the participants (45.5%) of 527 students were using smart devices for 7 hours and above, followed by (41.2%) who were using it between 4-6 hours, and only 14% of the participants were using them between 1-3 hours. Similar to these results, smartphone addiction is a worldwide phenomenon in a range of 9.3% to 48% of the population [20, 21]. In contrast to our results, in Kingdom of Saudi Arabia, another study was conducted among 2367 subjects; the majority (61%) of the study participants reported that they spend at least 5 hours per day using their smartphones, whereas 27.2% spend more than 8 hours per day[16]. Another cross-sectional study was conducted in Saudi Arabia using an online google survey form included 2435 participants, most of the participants who use a smart device, allocate 5-8 hours per day and represent (31.2%), while who use it for 2-4 hours a day represent (27.1%) [22]. In Jeddah, a cross-sectional study was conducted on 203 sixth-year medical students at the Faculty of Medicine, King Abdul-Aziz University, which reported that the overall prevalence of smartphone addiction was 66 (36.5%) [23]. Another study carried out in a group of King Saud University students to investigated smartphone addiction revealed that addiction percentage among participants was 48% [21]. A mixed-method study that included systematic-review and meta-analysis found that the smartphone addiction magnitude in India ranged from 39-44% [24]. Another study was conducted on a sample comprising of 587 students of the repudiated school. Students were assessed with a specially designed preform, and the smartphone addiction scale (SAS) reported that 53.62% were low users, and 33.3% were high users of smartphones as estimated by Smart Phone addiction scale [25].

Regarding the association between smartphones addiction and neck disability, our study found that neck disability was significantly more in participants who were using the screen for 7 hours and more ($p=0.015$). Similarly, another study was conducted among 100 participants showed that the degree of smartphone influence was significantly correlated with musculoskeletal discomfort in the participants. They found a moderate positive correlation between both Smartphone Addiction Scale (SAS) and the Neck Disability Index (NDI) ($p<0.001$). Moreover, SAS showed a higher score- indicating addiction to smartphone use, along with it, the scores of NDI showing moderate disability (30-48%-moderate disability) [5]. In Riyadh, The result of another study showed

a clear association between addiction to smartphone use and various degrees of neck problems among the participants [6]. In 2016, Sang in Jung conducted a study at Daegu University, South Korea, taken from fifty volunteers using the electronic devices daily. It showed that using a smartphone for a prolonged duration could negatively affect posture; therefore, predisposing the users to vertebral diseases and neck pain [26].

Furthermore, Kim et al. (2015) reported that a longer duration of smartphone usage caused a higher degree of neck pain [27]. Other studies have found that smartphone use could be related to musculoskeletal symptoms, including muscular fatigue and tenderness, as well as a decreased cervical range of motion [28]. In general, smartphone addiction could cause significant neck disability because of the bad posture associated with their use [28].

Conclusion:

The study concluded that the majority of cases using smartphones for 7 hours and above, and there were significant correlations between smartphones usage and neck disability. This finding highlighted the need to increase the awareness of the negative impacts of the prolonged use of smartphones on our health.

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Original article :

Community awareness about disaster preparedness: Principal component analysis (PCA)

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Abstract

Background:
Responsibility for disaster preparedness is not limited to healthcare institutions and healthcare providers; communities must also be involved. Knowledge of community members' awareness of disaster preparedness will enhance and strengthen a community's resilience to disaster. This study therefore explored factors related to community members' perceptions of disaster.

Methods:
A cross-sectional study was conducted, and principal component analysis (PCA) was used to extract essential factors from the data. Questionnaires were used to collect ordinal (yes; no) and Likert scale (ranging from 1 = strongly disagree to 5 = strongly agree) data from visitors to the Department of Applied Medical Sciences at Taif University. The questions were designed to understand how participants prepare for disasters. Descriptive analysis and PCA were conducted using a PCA extraction method. Varimax rotation was

الملخص

الخلفية:
لا تقتصر مسؤولية التأهب للكوارث على المؤسسات ومقدمي الرعاية الصحية بل يجب أن يشارك المجتمع أيضًا في الاستعداد للكوارث. إن معرفة العوامل المتعلقة بإدراك أفراد المجتمع للتأهب للكوارث ستعزز وتقوي مرونة المجتمع في مواجهة الكوارث. لذلك تهدف هذه الدراسة لاستكشاف العوامل المتعلقة بتصورات أفراد المجتمع تجاه تحضيراتهم للكوارث.

طرق البحث:
تم إجراء دراسة مقطعية مستعرضة وتم استخدام تحليل المكونات الرئيسية لاستخراج العوامل الأساسية من البيانات حيث تم استخدام الاستبيانات لجمع البيانات تشمل عدة أسئلة ذات الأجوبة بنعم ولا وأيضا الأسئلة التي تتطلب الأجوبة باستخدام مقياس ليكرت (يتراوح من ١ = لا أوافق بشدة إلى ٥ = موافق بشدة) تم جميع البيانات من عينة من افراد المجتمع عند زيارتهم لكلية العلوم الطبية التطبيقية. تم تصميم الأسئلة لفهم كيفية الاستعداد للكوارث حيث تم تحليل البيانات وصفيا وذلك عبر التحليل العاملي.

النتائج:
من بين المشاركين في العينة، أجاب ٣٨٣ (٦٥,٢٠٪) على الاستطلاع. كانت الأغلبية من الذكور، بينما كانت نسبة الإناث فوق

used with Kaiser normalization, and loading on the factor had to be above 0.40.

Results:
Of the participants sampled, 383 (65.20%) responded to the survey. The majority were male, and just over a quarter were female. Community members were found to lack emergency and disaster kits, safety measures, and fire extinguishers in their homes. In total, three factors were extracted by the PCA: (1) perception of government efforts, (2) readiness of community members, and (3) general knowledge regarding disasters.

Conclusions:
This study showed a lack of preparedness for and awareness of disasters. It is therefore recommended that the government facilitate and educate community members to ensure that all families have a well-established disaster plan.

Keywords:
Community; Saudi Arabia; Disasters; Plan; Preparedness

الربع بقليل. كان أعضاء المجتمع يفتقرون إلى حقائب الطوارئ والكوارث، وتدابير السلامة، وطفاية الحريق في منازلهم. في المجموع، تم استخلاص ثلاثة عوامل من قبل محكمة التحكيم الدائمة على النحو التالي: (١) التصورات حول الجهود الحكومية، (٢) جاهزية أعضاء المجتمع، و (٣) المعرفة العامة فيما يتعلق بالكوارث.

الخلاصة:
وعلى ضوء هذه النتائج أظهرت هذه الدراسة عدم الاستعداد والوعي بالكوارث. لذلك توصي الدراسة بزيادة الوعي التثقيف لجميع أفراد المجتمع وأيضا التأكد من ان جميع الأسر لديها خطة كوارث راسخة وقابلة للتطبيق

Introduction

Responsibility for disaster preparedness is not limited to healthcare institutes and healthcare providers; the community must also be involved. Communities play a major role in preventing disasters, responding to them by following warning instructions [1]. When communities hear, believe, and act on warning instructions and information regarding disaster risks and hazards, they can be mitigated, which builds community residences [1, 2]. Developing community responsibility for managing disasters starts by providing communities with information about all aspects of disaster management.

Hazards that might cause damage and disturbance to a community's functions can be either natural or man-made; these hazards cause danger, which increases the probability of disaster [3-6]. Risk refers to the probability that a disaster will occur. Dangerous events can be prevented,

and risk can be mitigated to reduce the probability of a causal event. Community members' awareness of risk, especially of events that may lead to tragedy, enhances and facilitates disaster prevention, helping people deal with disasters effectively if they occur [7]. The steps of risk modification are as follows: (A) assessing sources of damage, (B) examining sources of damage, (C) analyzing sources of damage, (D) summarizing findings, (E) combining information, and (F) developing a plan and sharing it. A community must recognize all steps [1-3] and participate in them to prevent hazards.

Existing literature highlights the importance of a high level of community contribution in responding to a disaster. Families and local communities are on the frontlines of disasters, and they can contribute by applying safety measures [8]. Safety measures may include at least one family member completing training (e.g. conducting drills), having a basic emergency supply kit at home with items including a first aid kit, mask, non-prescription medications (e.g. pain relievers), cell phones with chargers and a backup battery, and a fire extinguisher. By following safety measures in a timely manner, community members can significantly reduce disasters' effects and associated injuries and mortality [8].

Preparing the community is key to enhancing community members' attitudes, and this preparation may be achieved through strategies such as educational activities and programs to raise awareness. Another strategy is to empower community members to be good citizens and who take responsibility for managing a disaster together. Several studies have been conducted to evaluate the level of disaster preparedness of Saudi Arabian health institutions and healthcare providers, as a result of which more strategies and competencies have been developed to ensure healthcare providers are prepared to respond to disasters and crises and recover very quickly [9-14]. However, none of the studies evaluating the level of disaster preparedness have focused on the availability and awareness of safety measures at home. The aim of this study was to assess perceptions and explore related factors.

Methods

The study used a non-experimental research design with a self-report survey. Data were collected from community members who were sent links to online questionnaires on SurveyMonkey. The sample comprised community members visiting the Department of Applied Medical Sciences at Taif University, who com-

pleted the survey and shared it with their relatives. The study was open to all community members above age 18 who were able to write and read. This study excluded all non-Saudi participants. The sampling methods for this study were convivence using an online survey. The sample size was calculated to meet the requirements of factor analysis; as the population size was not known, the sampling calculation was based on the requirements of PAC, and the sample size was determined to be 100. Sample sizes must be above 100 to ensure the reliability of findings. This has been supported by many experts in the field of factor analysis [15, 16]. After starting to collect data, the researcher boosted online survey response rates by sending emails or messages to participants who were willing to participate in the study. The authors followed ethical principles, and the participants' submission of their responses to the authors indicated their agreement to participate in the study.

The authors developed the survey based on the literature review, and it collected demographic data, including age, gender, social status, and qualifications (data). The survey asked a variety of "yes" or "no" questions about whether they had an emergency kit, whether they had experienced a disaster or tragic event, what safety equipment they had available at home, and whether they had a fire extinguisher at home. The reliability of this part of the survey was 0.78, which indicates relatable as the variable lies within the normal range. The third part of the survey collected data about participants' perceptions and level of awareness of community disasters using a 16-item Likert scale questionnaire (1 = strongly disagree, 2 = disagree, 3 = natural, 4 = agree, 5 = strongly agree). The reliability score of the third part, after all redundant items were deleted, was within the normal range (0.80).

Data analysis was conducted using SPSS version 24 [17] to calculate frequencies and percentages of demographic data and of data from "yes" or "no" questions. Means and standard deviations of all items rated using a Likert scale were recorded. A value below 2.5 (50%) indicated a low level of preparedness, a value between 2 (50%) and 4 (80%) indicated a moderate level of preparedness, and a value above 4 indicated a high level of preparedness. PCA was used to remove redundant items and categorize the remaining ones into factors. The PCA protocol was adapted according the guidelines for exploratory factor analysis [16]. An independent samples t-test was conducted to compare the extracted factors with those of male and female subgroups and subgroups of those who did and did not have an emergency and disaster kit.

Results

Of the sampled participants, 383 (65.20%) responded to the survey. The majority were male, and just over a quarter were female. The majority of participants were married (64%). In terms of education level, most participants were in the undergraduate group and the primary school group had the lowest number of participants. Table 1 presents participants' demographic data, including gender, marital status, and education level.

Table 1:Demographic data

Category	Subgroup	Frequency	Percent
Gender	Male	253	65.2
	Female	130	33.5
Total		383	98.7
Age	20–29	172	44.3
	30–39	118	30.4
	40–49	57	14.7
	50 and above	41	10.6
Total		388	100.0
Marital Status	Single	132	34.0
	Married	247	63.7
	Other	9	2.3
Total		388	100.0
Education Level	Primary	5	1.3
	Secondary	72	18.6
	Bachelor	282	72.7
	Postgraduate	29	7.5
Total		388	100.0

Interestingly, only around a third (35.8%) of participants had an emergency and disaster kit, while around two thirds (64.2%) had no kit. Around 77% had not experienced a disaster in their lives, while just below a quarter had. Only a few participants were able to implement safety measures in their home, while more than 60% had taken no safety measures. Similarly, most participants had no fire extinguisher at home. Table 2 presents the frequencies and percentages of participants' experiences.

Table 2: Safety measures at Home for Disaster Preparedness

Category	Subgroup	Frequency	Percent
I have an emergency and disaster kit.	Yes	139	35.8
	No	249	64.2
Total		383	100.0
I have experienced a disaster.	Yes	88	22.7
	No	300	77.3
Total		388	100.0
Safety measures are available in my home.	Yes	140	36.1
	No	248	63.9
Total		388	100.0
I own a fire extinguisher at home.	Yes	78	20.1
	No	310	79.9
Total		388	100.0

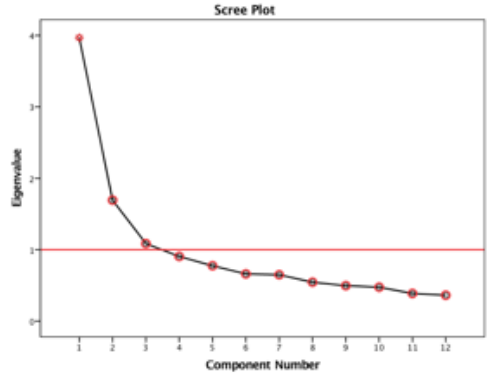
The overall score for community members' level of preparedness was below the cut-off point (2.5), which indicates a low level of preparedness, as shown in Table 3.

Table 3: Safety measures at Home for Disaster Preparedness

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Level of Preparedness	384	2.8693	.70	-.09	.12	-.39	.24

Figure 1 presents all the factors. Factors were extracted if they had eigenvalue plots above the elbow of a scree plot (those above the red line in Figure 1).

Figure 1: Scree plot showing all factors



Five iterations of PCA extracted three factors, which can be summarized as: (1) community awareness of the government's disaster preparedness efforts (2) individuals' readiness (3) knowledge regarding disasters. These factors have an explained variance of 56.24%, which is in the normal range of 50–100%. Table 4 indicates the accepted loading of items on factors, as the differences in these cases were greater than 0.40. The factor Rotation Achieve simple structure, which presented the items in three factors as follows:

Six items were loaded onto the first factor, which explained community awareness of the government's disaster preparedness efforts. The loading of these items ranged from 0.81 to 0.58. The item with the highest loading was "There are shelters in my community adapted and specialized to receive people affected by disasters," which had a mean score of 3.30 and a standard deviation of. The item with the second highest loading was "Competent authorities offer courses sufficient to educate the community about disasters," which had a mean score of and a standard deviation of. The item with the third highest loading was "Sufficient care is taken to provide safety facilities in roads, parks, schools, and other private facilities," which had a mean score of 3.42 and a standard deviation of 1.25.

The second factor explored in this study focused on individuals' plan in the event of a disaster, level of preparedness, and background in and information about disasters. Three items were loaded on this factor, with loading scores ranging from 0.85 to 0.51. The item with the highest loading was "I have a disaster plan at home," which had a mean of 3.06 and a standard deviation of 1.14. The third factor was related to participants' knowledge of disasters in general. Three items were loaded on this factor, with loading scores ranging from 0.76 to 0.65. The item with the highest loading score was "I have information on and a background in types of disasters". This factor focused on knowledge regarding disasters.

Table 4: Descriptive statistics showing the accepted loading of items on factors

Items	Factors			Descriptive Statistics		
	1	2	3	M	SD	h
There are shelters in my community adapted and specialized to receive people affected by disasters.	.81	.03	−.01	3.30	1.26	.66
Competent authorities offer courses sufficient to educate the community about disasters.	.78	.16	−.04	3.45	1.31	.64
Sufficient care is taken to provide safety facilities in roads, parks, schools, and other private facilities.	.72	.08	.11	3.42	1.25	.54
Society is knowledgeable about disasters.	.70	.17	.05	3.39	1.12	.52
I believe that competent authorities take precautions to reduce the risk of disaster risk in my community.	.65	.18	.08	2.50	1.20	.50
We have plans to secure dangerous items in the event of a disaster.	.58	.47	.11	3.36	1.22	.58

Items	Factors			Descriptive Statistics		
	1	2	3	M	SD	h
I have a disaster plan at home.	.14	.85	.02	3.06	1.14	.74
I am adequately prepared to face a disaster.	.10	.82	.18	2.69	1.09	.72
I have a background in emergencies and disasters.	.28	.51	.23	2.55	1.16	40.
I have information on and a background i n types of disasters.	.04	.15	.76	1.34	.47	.71
I know the difference between natural and man-made disasters.	−.03	.04	.71	1.11	.31	.51
I have sufficient knowledge to communicate with competent authorities in the event of a disaster.	.11	.12	.65	1.25	.43	.50
Explained variance for each factor	26.23	16.70	13.31	----	------	---
Total	56.24			2.61	0. 99	0.60

All three factors have normal distribution values within the normal range of skewness and kurtosis (+2.0 to -2.0). There was a significant difference between the two groups for items loaded on factor two, including whether they had an emergency and disaster kit (M = 2.94, SD = 0.87) and emergency bags and equipment (M = 2.48, SD = 0.81; t [384] = −5.08, p = 0.01 two-tailed) at home. The magnitude of the differences in means (mean difference = 0.50, 95% CI: −0.64 to .28) was very high (eta squared = 0.06). For items loaded on factor three, there were differences between male (M = 1.20, SD = 0.28) and female (M = 1.31, SD = 0.31; t (380) = −3.46, p = 0.01 two-tailed) groups. The magnitude of the differences in means (mean difference = 0.50, 95% CI: −0.17 to .05) was very small (eta squared = 0.03). Details are given in Tables 5 and 6.

Table 5: Independent samples test comparing extracted factors between subgroups of those who did and did not have emergency and disaster kits

F		Levine's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper	
Factor 1	Equal variances assumed	.40	.52	-1.60	384	.108	-.15499	.09632	-.34436	.03439

F		Levine's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper	
Factor 1	Equal variances not assumed			-1.61	281.123	.108	-.15499	.09622	-.34439	.03441
Factor 2	Equal variances assumed	.93	.33	-5.01	384	.000	-.46020	.09065	-.63843	-.28197
	Equal variances not assumed			-5.190	298.809	.000	-.46020	.08867	-.63469	-.28570
Factor 3	Equal variances assumed	1.78	.18	-1.81	385	.065	-.05788	.03125	-.11933	.00356
	Equal variances not assumed			-1.900	304.559	.058	-.05788	.03047	-.11784	.00207

Table 6: Independent Samples Test comparing extracted factors between male and female subgroups

F		Levine's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Factor 1	Equal variances assumed	.15	.69	.39	379	.69	.03	.09	-.15	.23
	Equal variances not assumed			.390	257.78	.69	.03	.09	-.15	.23
Factor 2	Equal variances assumed	.73	.39	-1.13	379	.25	-.10	.09	-.29	.07
	Equal variances not assumed			-1.16	279.44	.24	-.10	.09	-.29	.07
Factor 3	Equal variances assumed	1.51	.20	-3.46	380	.01	-.10	.03	-.17	-.04
	Equal variances not assumed			-3.34	235.75	.01	-.10	.03	-.17	-.04

Discussion

Community members play an important part in disaster preparedness and response, which increases their community's resilience to disaster. This study explored community members' perceptions of disaster preparedness in Taif city, Saudi Arabia. The findings of this study indicated that (A) most community members did not have an emergency and disaster kit, (B) most community members had no experience with disasters, (C) safety measures were lacking, (D) not all community members had fire extinguishers, (E) awareness of preparedness is essential, (F) individuals' readiness in terms of having a plan for community members is important, and (E) general knowledge about disasters is one of the most important components of disaster awareness in a community.

This study indicated that most of the population needed to improve its disaster preparedness. First, most did not have emergency and disaster kits at home. This was a disappointing finding; more effort is needed to ensure that homes have the basic equipment for responding to emergencies and saving lives. The existing literature has focused on the importance of an emergency and disaster kit with a first aid kit, a cell phone, a flashlight, and other materials that vary according to local risks and hazards[18]. Second, the population lacked experience in responding to disasters, as most had never experienced one. This might be related to the rarity of disasters in Saudi Arabian communities; however, as COVID-19 has caused a worldwide pandemic at the family and community level and at the level of health organizations, many families have begun to recognize the importance of disaster preparedness at home[19]. Third, this study confirmed the importance of implementing safety measures at home, in contrast to a study conducted in the United States, which found that only 17% of 314 participants had no functioning smoke detector [20]. Finally, it is important to have fire extinguishers in every home and workplace. This study confirmed that around 80% of participants had no fire extinguisher, similar to the finding in the United States that 50% of participants had no fire extinguisher in their home [20].

The first factor community members must be aware of is preparedness in terms of shelters, safety, and percussing. A study conducted in the United States found that less than half of participants perceived themselves to be prepared for disasters [13]. In this study, community members perceived themselves to be moderately prepared for disasters, which is inadequate. It is important to increase community aware-

ness of disasters in Taif City by creating strategies to strengthen the community's preparedness to deal with risks, especially approaches that use existing facilities. Participants perceived that adequate educational programs to increase community awareness of disasters and adequate shelters and measures were available.

Shelters house and provide medical care for people affected by disasters or those whose homes have been lost or damaged. Knowledge of where to access shelters enhances the effectiveness of disaster response and recovery. Participants perceived themselves to know where shelters were located in their communities, but a strong plan is needed to help shelters identify the community's needs. A Japanese study highlighted the need for electricity, accessible food, and the use of public and private facilities [5]. This finding suggests that more effort must be made to develop and improve the effectiveness of shelters and education on disasters and that further research must be done. In Saudi Arabia, community education on community awareness of disasters is new, but it has been incorporated into the disaster medicine curriculum [21], and its content is based on the principles and needs of communities. Short sessions at schools and other public facilities, such as shopping malls, are raising community awareness in parts of Saudi Arabia at risk of earthquakes, flooding, and pandemic outbreaks [21].

Planning is essential when responding to a disaster. Plans vary in terms of type and level and across institutional, regional, and family levels [6, 9, 10]. It has been confirmed that families' disaster preparedness is one of the most important issues related to planning community responses to disasters[6]. Encouraging community members to have a disaster plan at home will enhance their preparedness and response [22]. The literature shows that whether a family had a disaster plan influenced healthcare providers' willingness to respond to a disaster, as this affected their response to the disaster in hospitals [14, 23]. It is therefore very important for families to have a disaster plan in place and to help them develop such plans through instruction or short training courses.

Community members should have enough information and knowledge about disasters and be able to communicate with relevant organizations to enhance their level of preparedness, enabling effective responses and recovery. The findings of this study confirmed that community members must know about different types of disasters. In the literature, disasters have been categorized as natural, such as earthquakes, flooding, pandemics, and volcanic eruptions, or man-made, such as war and ter-

rorism. This finding was consistent with other studies conducted in Saudi Arabia and found that the population lacked information and knowledge about risks and disasters [4, 24]. It is therefore essential to build strategies that increase the population's knowledge of disasters and improve their disaster response. Much research on the topic of disasters in Saudi Arabia has been conducted in the fields of health, education, and technology [11, 12, 21, 25, 26], but research on disaster at the community level is sparse, so information and knowledge is limited.

Conclusions

The findings of this study show the importance of disaster preparedness in Saudi Arabia's population; increasing readiness for disasters will require much effort by the government and community members to enhance the country's resilience to disasters. More educational programs for families and community populations are needed to increase their awareness about disasters and their impact, to help them prepare an emergency and disaster kits, to ensure that families have safety measures in place and presence of fire extinguishers at home.

The study recommends that all families must have a well-established disaster plan. More effort from the government is needed to facilitate these measures and educate the community members as this area has received little attention in research and education.

Limitations

Limitations of this study include its design as a survey, which might affect the results' generatability. This study must therefore be replicated in other areas of Saudi Arabia. Some issues regarding the sampling technique must also be considered, as the subgroup of the population of Taif is not very well known.

Conflicts of interest

We declare no conflicts of interest. The study was not funded.

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Case report:

Saudi Child with a Novel Mutation Causing Hereditary Spherocytosis, a Case Report

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Abstract

Spherocytosis is a descriptive terminology of red blood cells, which has a spherical shape rather than the normal biconcave shape of the normal red blood cells.

Hereditary spherocytosis (HS) is an inherited blood disorder, which has large heterogenic presentation with both autosomal dominant inheritance and less frequently in an autosomal recessive mode of inheritance.

Saudi Arabia is known to have high consanguineous marriage, which makes the population on a higher risk of developing different inherited disorders including HS.

We are reporting a novel pathological mutation in a child with HS which caused him to have hemolytic anemia since the age of 2 years. To our best knowledge, this is the first time this new mutation is reported in the medical literatures.

Keywords:
Hereditary Spherocytosis, Mutation, Hemolytic Anemia, Consanguinity, Saudi Arabia.

الملخص

طفل سعودي يعاني من طفرة جينية جديدة تسببت في تكور كريات الدم الحمراء الوراثي .

تقرير حالة طفل.

مرض تكور كريات الدم الحمراء هو مصطلح وصفي لخلايا الدم الحمراء التي لها شكل كروي بدلاً من شكل ثنائي الموجة لخلايا الدم الحمراء الطبيعية.

تكور كريات الدم الحمراء (HS) هي اضطراب دموي وراثي ، ولديه اعراض كثيرة غير متجانسة حيث يظهر كحالة وراثية متنحية وبشكل اقل شيوعًا كحالة وراثية جسدية سائدة التوريث مما يسبب تكسر انحلالي للدم.

من المعروف أن المملكة العربية السعودية لديها نسب عالية من الزيجات بين الأقارب ، مما يجعل الاجيال كثر عرضة لخطر الإصابة باضطرابات وراثية بما في ذلك تكور كريات الدم الحمراء الوراثي HS.

في تقرير هذه الحالة نسجل طفرة جينية مرضية جديدة في طفل سعودي مصاب بتكور كريات الدم الحمراء مما تسبب في إصابته بفقر دم انحلالي منذ عمر العامين. على حد علمنا هذه هي المرة الأولى التي يتم الإبلاغ عن هذه الطفرة الجينية في المجلات الطبية.

الكلمات الدالة

تكور كريات الدم الحمراء ، طفرة ، فقر الدم الانحلالي ، الأقارب ، المملكة العربية السعودية.

Introduction:

Hereditary spherocytosis (HS) are a group of inherited disorders in which Red blood cell (RBC) membrane is affected and partially lost, causing a non-immune hemolytic anemia of different severity due to decrease life span attributed to the loss of the ability of deformability found in the normal RBCs.

It was since 1871 when spherocytosis was first reported, then the genetic nature of the disease was suggested by Wilson in 1980, after which it was described subsequently with time in more detail. [1, 2]

HS is more common in certain ethnicities like in North Europe [2]. In the United States of America, the incidence of HS is estimated to be 1 in 5,000 where most patients have an autosomal dominant inheritance though, around 25% of cases have no obvious family history of the disease, which is attributed to new mutations in affected persons[3,4]. Osmotic fragility testing of suspected patients are helpful but the advanced techniques are more specific and sensitive in diagnosing cases and finding the genetic mutations causing the abnormalities.

Material: A Case Report

Our patient is a 12-year-old boy who presented to the department of Pediatrics' hematology clinic in Madinah Saudi Germany Hospital in January 2018 with history of recurrent easy fatigability, pallor, and attacks of jaundice along with dark discoloration of urine caused by urobilinogen since the age of 2 years.

The family sought medical advice several times, where he was labeled as a case of iron deficiency anemia.

He was treated with oral iron in different occasions but with no significant improvement in his hemoglobin. He received blood transfusion twice in the past for low hemoglobin reaching 7 g/dl and symptoms of anemia, but without definitive diagnosis. Folic acid supplement was started two years ago, after which he started to feel some improvement.

His mother gave a history of iron deficiency anemia, but she never received blood transfusion, and she denied any history of a blood disorders in the family nor history of splenectomy. Parents are second-degree cousins having another son and daughter who are normal.

His examination revealed that he looked well with normal growth parameters in the 25th centile for weight and height, stable vital signs and with no obvious dysmorphic features. He was active, pale with mild jaundice affecting mainly his sclera. He had no lymphadenopathy, his spleen was palpable 3 cm below the costal margin.

His liver border was just palpable below the right costal margin with a liver span of 10 cm. His heart examination showed normal heart sounds with a soft hemic murmur mainly heard over the aortic area. He had normal skin examination with no petechial rash or bruises. The central nervous system examination was grossly intact.His laboratory investigations included a complete blood count CBC and differential (Table 1).

Table 1: CBC, Differential

Tests	Results	Normal ranges*
WBC	5.3	4-15.5 x 10^3 µ/L
HGB	98	12-16 g/L
RBC	3.6	4.3-5.7 mil/ µL
Hct	30	38-80 %
Platelets	230	150-400 10^3/ µL
MCV	64	68-79 Fl
MCH	30	19-28 Pg
MCHC	42	30-38 g/dL
RDW	15.5	11-15%
Retics	7.5	0.5-1.5%
Absolute Retics Count	309	10-110x10^9/L
Neutrophils	48.6	40-74%
Lymphocytes	34.8	14-46%

* From El-Hazmi, Mohsen AF, and Arjumand S. Warsy.
"Normal reference values for hematological parameters, red cell indices, HB A2 and HB F from early childhood through adolescence in Saudis." Annals of Saudi Medicine 21.3-4 (2001): 165-169.

His peripheral blood smear showed numerous spherocytes with no abnormalities in other cell lines while his Coombs test was negative and the electrophoresis showed Hgb A 97.8%, Hgb A2 2.2% (normal up to 2.5%).

His liver function tests are shown in (Table 2) while his Urea, Creatinine, Electrolytes and blood gases were all within normal limits.

Table 2: Liver function tests*

Test	Results	Normal range
Aspartate aminotransferase (AST)	25	10-43 U/L
Aminotransferase (ALT)	30	10-100 U/L
Alkaline phosphatase	494	24-147 U/L
Bilirubin total	33.7	1.71-20.5 µmol/L

Test	Results	Normal range
Bilirubin direct	10.8	0-5.1 µmol/L

*From Thapa, B. R., and Anuj Walia. "Liver function tests and their interpretation." The Indian Journal of Pediatrics 74.7 (2007): 663-671.

Osmotic fragility test could not be done in our lab nor eosin-5-maleimide binding test, acidified glycerol lysis test or sodium dodecyl sulfate-polyacrylamide gel electrophoresis. His coagulation profile while his urine analysis showed moderate urobilinogen.

Ultrasound abdomen showed splenomegaly of 11.4 cm and hepatomegaly of 11.9 cm, with gallbladder having mild thick wall and few gallbladder stones not obstructing the common bile duct and normal looking other organs.

Management

Our patient is managed with a folic acid supplement with regular follow up in hematology clinic to monitor his hemoglobin levels along with liver functions and his family were referred to genetic counselling Screening for mother was normal, but we could not bring the father to be tested.

Surgical splenectomy following the HS guidelines published in 2004 was deferred as long as our patient is classified in mild to moderate group and that he remained stable [5].

Molecular genetic analysis for spherocytosis

Using enriched sequence capture technology of Roche/NimbleGen next-generation sequencing (NGS) sequenced on an Iliumina system; the coding exons of known spherocytosis genes was analyzed and revealed the following results (figure 1)

Figure 1: Variant identified:

Interpretations:

The sample was sent to Becenti laboratories in Germany. Using Next-generation sequencing (NGS) analysis a heterozygous variant identified the in c.281G>A p. (Trp94*) in the SLC4A1 gene, which leads to a pre-mature stop code and subsequent mRNA degradation (nonsense-mediated decay) or truncation of the protein.

To the best of our knowledge, the variant has not been described in the literature so far in Human Gene Mutation Database (HGMD 2019.2). Allele frequency of this variant was not documented in the general population as it is not been documented in genome aggregation data base (gnomAD) and this is the first time we have detected in our internal database considering the available information the variant is classified as pathogenic[6].

The pathogenic variance in the SLC4A1 gene (OMIM 109270) cause autosomal dominant spherocytosis type 4 and a segregation analysis of the identified variant in the parents to evaluate a possible de novo occurrence was advised using targeted molecular genetic testing of the family members of the patient. There is a 50% probability that the patient will transmit the SLC4A1 variant c.281G>A p. (Trp94*) to any of his offspring.

Methods:

DNA genomic was fragmented, both the end of the coding exons of the analyzed genes, along with the corresponding exon-intron boundaries, which were enriched using the Roche/NimbleGen sequence capture technology (SeqCap MedExome Library), it was amplified and sequenced at the same time by Illumina technology NGS using an Ilumina system. Requested gene panel was extracted from the whole-exome sequencing (WES) data. Target regions were sequenced covering almost 143-fold handling more than 99% of the regions of interest which obtained a 15-fold coverage. Using bioinformatics analysis tools as well as JSI Medical Systems software the data of NGS analysis was conducted. Against external and internal databases the identified variants and indels were filtered depending on their allele frequency with focusing on rare variants with a minor allele frequency (MAF) of 1% or less. In silico analysis of identified non-synonymous variants was performed using bioinformatics prediction programs like Mutation Taster, Polyphen-2, Mutation Assessor, FATHMM, etc. in silico analysis of spice site effects was performed by bioinformatics programs like Fruitfly, NetGene2, Human Splicing Finder, Mutation Taster, Splice view and ESE-Finder. These results should be interpreted having in mind the clinical findings, family history, and other laboratory investigations data as it is believed that the prediction programs are not equivalent to functional proof. The American College of Medical Genetics and Genomics ACMG guidelines was used for classification of variants [7].

A change of pathogenicity classifications over time cannot be excluded. Variants

class fed as (likely) benign are not reported. An insufficiently covered of the analyzed genes (A) were completed using polymerase chain reaction (PCR) amplification then was followed by conventional Sanger sequencing.

Putatively pathogenic differences between the wild type sequence (human reference genome according to UCSC Genome Browser: hg19, GRCh37) and the patient's sequence mentioned and interpreted in our case report were assessed using an in-house established quality score by Bioscientia laboratories. Variants reported and not passing the quality threshold were verified using PCR amplification then by conventional Sanger sequencing.

The sample identity was ensured by internal quality management procedures.

It is of importance to know the limitations of the NGS method as the coverage of WES data is partially far below target panel sequencing of genes for a distinct indication. In comparison, the evaluated sensitivity of WES versus panel sequencing is >99.5% (in-house validation data of Bioscientia) and that the pathogenic variants in regions which is insufficiently covered and other rare alterations in parts of the genes like in regulatory regions, low-level mosaics, or deep intronic splice variants cannot be excluded with this analysis. Furthermore, copy-number variations (e.g., deletions/duplications), complex structural rearrangements (inversions, translocations), and repeat expansions can be missed. Coding regions for which highly-homologous sequences exist in the genome are partially difficult to interpret.

This test was developed and its performance characteristics determined by Bioscientia, Ingelheim, Germany and it is not approved by the US Food and Drug Administration.

Discussion:

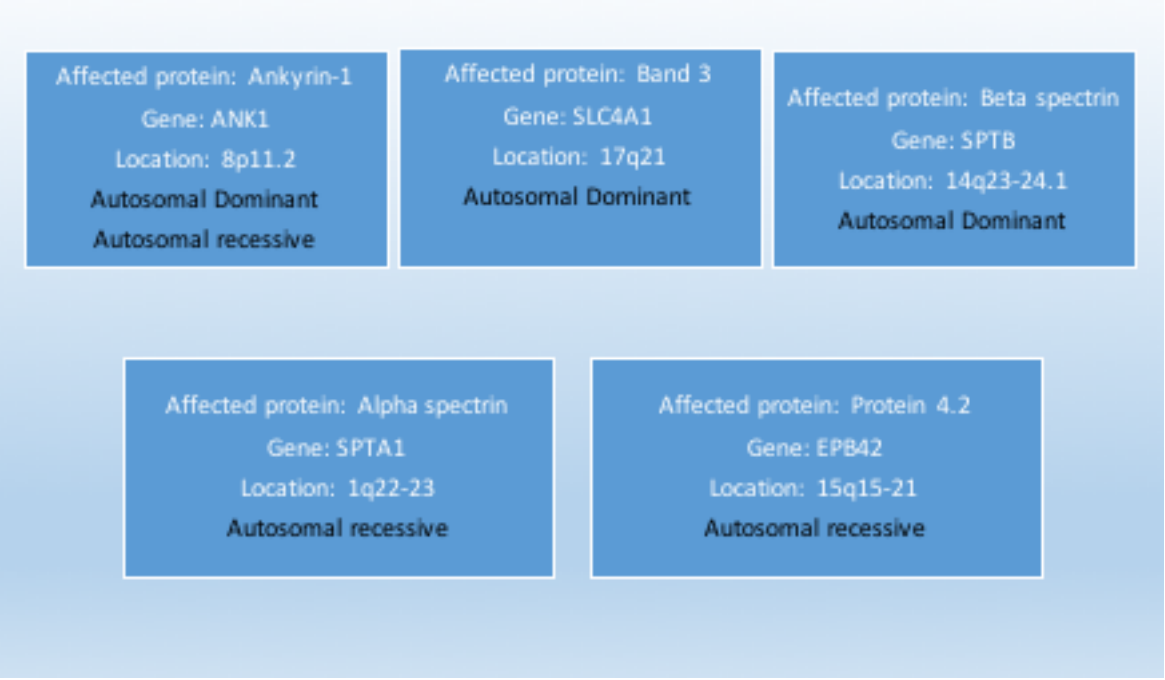
We lack population-based studies in Saudi Arabia in order to determine the incidence of HS in our population and to determine the most common types of mutations of those abnormalities.

Most of the published data are hospital-based and of a small number of patients [8].It is reported based on a small number of patients that health normal Saudis are not different from healthy Americans in regards to the RBCs membrane proteins, while on the other hand, they documented differences in the electrophoretic patterns of Saudi HS patients compared to deferent parts of the world [9].

HS is caused by mutations in one of the following genes: SPTA1 (1q21), SPTB

(14q23.3), ANK1 (8p11.21), SLC4A1 (17q21.31) and EPB42 (15q15-q21), that encode the red blood cell (RBC) membrane proteins erythrocytic 1 spectrin alpha chain, erythrocytic 1 spectrin beta chain, ankyrin-1, band 3 anion transport protein, and erythrocyte membrane protein band 4.2, respectively. Defects in these proteins lead to a loss in RBC membrane cohesion and membrane surface area, resulting in erythrocyte sphering, decreased deformability and premature destruction in the spleen sinuses causing it to be hemolyzed immaturely (Figure 2).

Figure 2: Types of mutations in HS



All are inherited as autosomal dominant except alpha spectrin mutation and Protein 4.2 Gene: EPB42, which is usually inherited as autosomal recessive [10].

Advances in conducting diagnostic testing using technologies of next-generation sequencing (NGS) helped a lot in discovering new cases, and new novel mutations as more than 80 ANK1 mutations and 35 SLC4A1 Allelic Variants have been reported in the literature causing HS, and in fact, it is proven to be cost-effective to detect other mutations in different genes linked to HS [11].

The clinical presentations of HS are variable in severity according to the type of mutations ranging from asymptomatic patients discovered during routine lab works or during family screening to very severe presentations of hemolytic anemia requiring blood transfusions. Hemolysis is associated with indirect hyperbilirubinemia,

sometimes with distal tubular acidosis as an association, and gallbladder stone formation and sequelae.

The bone marrow of affected patients will try to compensate for the chronic anemia calling for extramedullary hematopoiesis in spleen and liver with a report of posterior paravertebral mediastinum expansion as a result of the ongoing hematopoiesis [12]. It is also reported as in other hereditary hemolytic anemias, patient with HS are at risk to develop aplastic crises after infection by human parvovirus B19 [13].

HS is also reported with other types of hemoglobinopathies and enzymopathy, causing hemolytic anemia like sickle cell, thalassemia and pyruvate kinase deficiency and the coinheritance of uridine diphosphate glucuronosyltransferase 1A deficiency [14, 15].

Limitations:

We could not send for confirmatory tests for financial reasons as new mutant gene might not be validated unless it is confirmed. Our hospital is not running genetic testing in a local lab and therefore, samples were sent to Bioscientia laboratories.

Conclusion and Recommendations:

A new mutation is reported in this patient causing hemolytic anemia. HS should be in the differential diagnosis of any child with microcytic anemia not responding to iron therapy. We recommend having a national registry for hereditary spherocytosis to discover the most common genetic mutations in Saudi Arabia and describing the course of the disease and its complications in our population.

Consent:

Patient and his family consented before writing the case report.

Conflict of interest:

Author has no conflict of interest and did not receive any funding from any site.

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Guidelines for Manuscript Preparation

A. TYPES OF MANUSCRIPTS

I. ORIGINAL MANUSCRIPTS

Manuscripts submitted in this category are expected to be concise, well organized, and clearly written.
The maximum length is 5000 words, including the abstract, references, tables, and figure legends. The maximum length is 5000 words, including the abstract, references, tables, and figure legends.

- The structured abstract must not exceed 250 words.
- The title must not exceed 130 characters.
- A maximum of 4 tables and 4 figures is allowed.
- References should not exceed a maximum of 100.
- The abstract must be organized as follows:
- Background & Aims
- Methods
- Results
- Conclusions
- Do not use abbreviations, footnotes or references in the abstract.
- An electronic word count of the abstract must be included.
- Three to ten key words at the end of the abstract must be provided.

The manuscript must be arranged as follows:

- Title page
- Abstract
- Introduction
- Materials and methods (or Patients and methods)
- Results
- Discussion
- Acknowledgements
- References
- Tables
- Figure legends
- Figures

Acceptance of original manuscripts will be based upon originality and importance of the investigation. These manuscripts are reviewed by the Editors and, in the majority of cases, by two experts in the field. Manuscripts requiring extensive revision will be at a disadvantage for publication and will be rejected. Authors shall be responsible for the quality of language and style and are strongly advised against submitting a manuscript which is not written in grammatically correct English. The Editors reserve the right to reject poorly written manuscripts even if their scientific content is qualitatively suitable for publication. Manuscripts are submitted with the understanding that they are original contributions and do not contain data that have been published elsewhere or are under consideration by another journal.

II. REVIEW ARTICLES

Review articles on selected clinical and basic topics of interest for the readers of the Majmaah Journal of Health Science will be solicited by the Editors. Review articles are expected to be clear, concise and updated.

- The maximum length is 5000 words, excluding the summary, references, tables, and figures.
- References should not exceed a maximum of 150.
- The inclusion of a maximum of 4 high-quality tables and 4 colored figures to summarize critical points is highly desirable.
- Review articles must be accompanied by a title page and a summary.

- Reviews should include at least one Key Point Box, with a maximum of 5 bullet points, that briefly summarizes the content of the review.

Review articles are reviewed by the Editors and may be sent to outside expert reviewers before a final decision for publication is made. Revisions may be required.

III. EDITORIALS

This section consists of invited brief editorial comments on articles published in the Majmaah Journal of Health Science

The length of an editorial should not exceed 1500 words, excluding references.

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IV. CASE REPORTS

Case reports would be only accepted if they represent an outstanding contribution to the Etiology, pathogenesis or treatment of a specific condition.

- The maximum length is 3000 words, including the summary and references.
- A maximum of 2 tables and 2 figures is allowed.
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V. LETTERS TO THE EDITOR

Letters to the Editor will be considered for publication if they are related to articles published in recent issues of Majmaah Journal of Health Science. Occasionally, Letters to the Editor that refer to articles not published in Majmaah Journal of Health Science will be considered.

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- A maximum of 1 table or 1 figure is allowed.
- References should not exceed a maximum of 10.
- No more than 4 Authors may appear in the author list.

VI. COMMENTARIES

International commentaries will be solicited by the Editors only.

- Commentary articles should not exceed a maximum of 800 words, excluding tables or figures.
- A maximum of 1 table or 1 figure is allowed.
- References should not exceed a maximum of 10.
- A title page must be provided.

B. MANUSCRIPT SUBMISSION

ORGANIZATION OF THE MANUSCRIPT

- The submitted manuscript must be typed double-spaced throughout and numbered (including references, tables and figure legends). Preferably using a "standard" font (we prefer Times/Arial 12).
- For mathematical symbols, Greek letters, and other special characters, use normal text. The references must be in accordance with the Vancouver reference style (see References).
- Approved nomenclature for gene and protein names and symbols should be used, including appropriate use of italics (all gene symbols and loci, should be in italics) and capitalization as it applies for each organism's standard nomenclature format, in text, tables, and figures.
- Full gene names are generally not in italics and Greek symbols are not used. Proteins should not be italicized.
- Improperly prepared manuscripts will not be entered into the peer review process and will be sent back to the author for correction.

TITLE PAGE MUST CONTAIN:

- A title of no more than 130 characters.

- Running title (not to exceed 60 characters)
- Names of the Authors as it should be published (first name, middle initial, last name)
- Affiliations of all authors and their institutions, departments, or organizations (use the following symbols in this order to designate authors' affiliations: *, †, ‡, §, ¶, ||, #, **, ††, ‡‡, §§, ¶¶, || ||, ##).
- Name, address, telephone and fax numbers, and electronic mail address of the corresponding Author.
- Electronic word count.
- Number of figures and tables.
- List of abbreviations in the order of appearance.
- Conflict of interest.
- Financial support.

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1. Informed consent was obtained from each patient included in the study and
2. The study protocol conforms to the ethical guidelines of the 1975 declaration of helsinki as reflected in a priori approval by the institution's human research committee.

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Drugs and chemicals: Drugs and chemicals should be used by generic name. If trademarks are mentioned, the manufacturer's name and city should be given. All funding sources supporting the work, either public or private, especially those from pharmaceutical companies, must be provided.

Genetic Sequence data: In papers reporting a novel DNA or amino sequence, verification that the data have been or will be submitted either to Gen-Bank or EMBL is required. Please provide this verification and the accession number in the covering letter.

REFERENCES

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An example of how references should look within the text:

"HVPG was measured by hepatic vein catheterization using a balloon catheter according to a procedure described elsewhere [14, 15] and used as an index of portal hypertension [16]."

An example of how the reference list should look:

[14] Merkel C, Bolognesi M, Bellon S, Zuin R, Noventa F, Finucci G, et al. Prognostic usefulness of hepatic vein catheterization in patients with cirrhosis and esophageal varices. Gastroenterology 1992;102:973-979.
[15] Groszmann RJ, Wongcharatrawee S. The hepatic venous pressure gradient: anything worth doing should be done right. Hepatology 2004;39:280-282.

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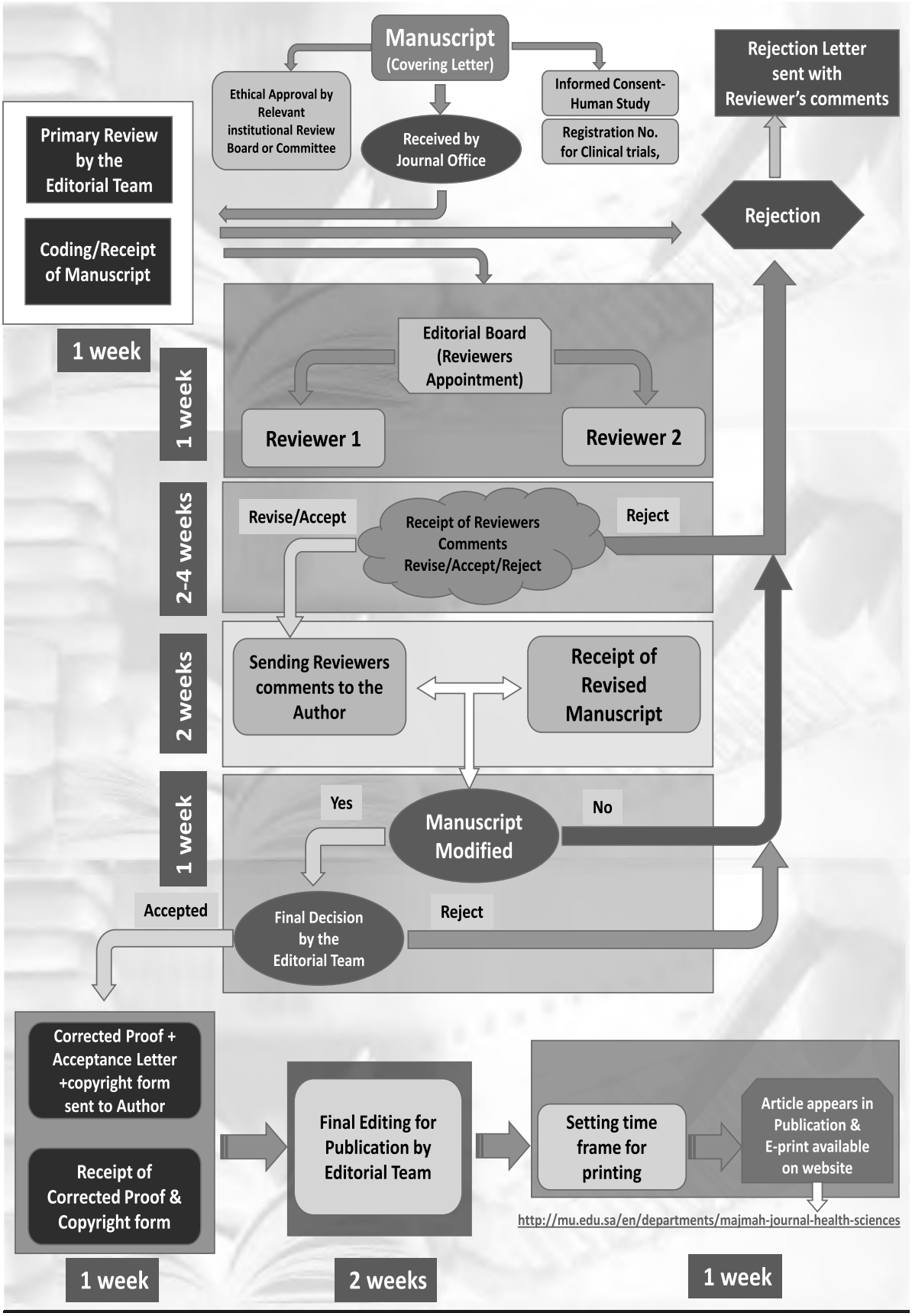
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