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AWARENESS AND ATTITUDE AMONG THE SAUDI POPULATION TOWARDS INTESTINAL OBSTRUCTION

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Abstract:

Objectives: *The increasing incidence of abdominal surgeries has increased the risk of potentially obstructive structures, such as bands or adhesions. Despite potentially fatal consequences, there is insufficient information available about bowel obstruction. The aim of this study to assess the awareness and attitude of the Saudi population about intestinal obstruction.*

Methodology: *A cross-sectional study was conducted in Saudi Arabia from July 2017 to December 2017 and involved 2019 participants. Our electronic questionnaire was published online through social media; the collected data were translated back from Arabic to English, entered using Microsoft Excel 2016, and coded for seeking of analysis. Then, the data were verified and analyzed using Statistical Package for the Social Sciences (version . 21).*

Results: *The awareness level of participants about intestinal obstruction was good (at least 7 of 13) in 57.2% of our cohort, and poor (less than 7 of 13) in 42.8%. The mean awareness level score was 7 ± 2. Most(91.2%) of the participants believe that there are insufficient awareness programs regarding intestinal obstruction. Also, 87% of the participants have never completed a questionnaire similar to this study's questionnaire.*

Conclusions: *The awareness of intestinal obstruction inour study population was good. However, the participants believe there are insufficient programs to raise the awareness of this disease. We recommended enveloping more intestinal obstruction-focused educationalprogrammes in Saudi Arabia.*

Keywords: *Emergency operation; knowledge; practice; intestine; obstruction.*

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INTRODUCTION:

Today, with the increased incidence of abdominal surgery, a large proportion of patients areatrisk of developing potentially obstructive structures, such as band or adhesions, after openingof the peritoneal cavity. **(Ellis et al.,1999)**

The definition of acute bowel obstruction is as follows: "sudden interruption of the forwarding flow of intestinal contents, which might occur at any point in the gastrointestinal tract". Fifteen percentof patients with intestinal obstruction present to ER with acute abdominal pain. **(Patrick et al.,2011)**

There are preoperative, intraoperative, postoperative risk factors; surgical operations appear to be the most common risk factor for intestinal obstruction. **(Arung et al.,2011; Attardet al.,2007).**

In the small intestine, the most common cause of obstruction is adhesion,often from previous surgeries, such asabdominal and pelvic surgery . **(Attard et al.,2007; Barmparas et al.,2010; Foster et al., 2006; Markogiannakis et al., 2007)** Other causesincludea hernia and malignancies, as well as volvulus, intussusceptions, Crohn's disease, and gallstones. **(Fevang et al.,2000; Markogiannakis et al., 2007; Miller et al., 2000)**

The causes of large intestinal obstruction are volvulus, inflammatory bowel disease, obstructive colitis, diverticulitis, and colorectal carcinoma. **(Hayakawa et al.,2012&2013)**

A typical clinical picture arising from intestinal obstruction included cramping and belly pain that comes and goes, nausea, vomiting, abdominal distension, inability to pass gas, and hyperactive bowel sounds. However, the symptoms differ according to the obstruction site. If the obstruction is in the small intestine, the most common symptoms are vomiting or nausea, whereas obstructions in the large intestine are associated with continuous pain and abdominal distension. If the patient presents these latter signs and symptoms, laboratory and radiological tests should be performed. **(Patrick et al.,2011)**

Management of IO can be either conservative or surgical.It can be difficult to decide the best management approach, and factors that should be considered includeunstablepatient condition, fever, leukocytosis, unexplained acidosis or signs of peritonitis, which might indicate ischemia or even perforationand thusrequire urgent surgical exploration. **(Patrick et al.,2011)**

Conservative management involves: keepingthepatient fasting, giving aggressive Intravenous therapy (IV) fluids for rehydration, using Nasogastric Tube (NGT) for gastric decompression, IV antibiotics covering Gram-negative and anaerobes to prevent infection in patients about to be operated, and treating and preventing further bacterial overgrowth and translocation in the intestinal wall . **(Sagaret al.,1995)**

Resolution of intestinal obstruction cardinal symptoms with this type of management must be within 24 to 48 h, after this period frame the patients must be treated surgically because of the risk of complications suchas vascular compromise resulting in ischemia and perforation. **(Fevang et al.,2002)**

Perforation and ischemia of the bowel might cause peritonitis plus septicemia, fluid,and electrolyte imbalance, and hypovolaemia plus septicemia,which contribute to circulatory collapse and acute kidney injury. **(Ramanathan et al. 2017)**

Because of the dearth of information about bowel obstruction, here we aimed to assess the knowledge, attitude, practice, and awareness of the Saudi population about intestinal obstruction causes and outcomes.

METHODOLOGY:

This is cross-sectional study was conducted in Saudi Arabia during a 6 months period(July 2017 to December 2017) to assess the knowledge, attitude, practice, and awareness of the Saudi population about intestinal obstruction causes and outcomes. Our study included 2019 participants (male: 46.5%, female: 53.5%). The inclusion criteria were: Saudis living in any regions of KSA,and of any educational level and age. Non-Saudi nationals were excluded.

The ethics approval for this study was obtained from the scientific research and medical ethics committee of medical college Taif University. The consent of the participants was required and was addressed bythe firstquestion of the questionnaire.

Our electronic questionnaire was published through social media by data collectors during a 1-week period. The data sheet was divided into four sections. The first gathered demographic information about participants, including gender, age, region, marital status, number of children if married, educational level, and job. The second section addressed past medical and surgical history; the focus was on the

conditions thatmight put the participant at the risk of developing intestinal obstruction. Also, from this data sheet, we gathered information about the prevalence ofthe various types of obstruction in KSA, as well as thediagnostic and management methods used by the hospital in KSA. The final section addressed the participants'knowledge and awarenessand includesquestions aboutrisk factors, causes, clinical picture, diagnostic methods, management, complications, and prevention of the intestinal obstruction.

The collected data were translated back from Arabic to English, entered into a spread sheet(Microsoft Excel 2016) and coded for analysis. Then, the data was verified and analyzed with the help of a biostatistician using Statistical Package for the Social Sciences (SPSS, v. 21) developed by International Business Machines (IBM®) Corporation. Statistical tests were descriptive analysis intheform of frequencies, percent, and weighted mean. Demographic data and categorical variables were presented as frequencies, percentages,andmean ± standard deviation. The association between the parameters were assessed using p-value and were consideredstatistically significant when less than 0.05.

RESULTS:

Sociodemographic data

A total of 2019 respondents participated in the study. Among the respondents, 1081 (53.5%) were female,and 938 (46.5%) were male. The mean ageof the respondents was 34 ± 12 years. The distribution of the participants across the regions of Saudi Arabia was central (27.6%), west (23.3%), east (20.8%), south (18.9%), and north (9.4%). Most of the respondents weremarried (56.9%), followed by single (39.6%), divorced (2.3%), and widowed (1.2%). The mean of children number was 2 ± 3, and most of the participants (49.6%) had no children. Regarding educational level, most of the respondents are educated to university level (68.4%), followed bysecondary school (18.2%), postgraduate (9.9%), intermediate school (2.8%), primary school (0.7%), and uneducated (one participant). The participants' occupations were governmental (civil, 31.6%), student (31.1%), housewife (12.5%), private sector (8.4%), retired (7.1%), governmental (military, 6.6%), and freelance worker (2.6%). As for the family history of intestinal obstruction, this was negative in 94.5% of the participants.

History of illnesses

Two-thirds (66.6%) of the participants had no previous history of illnesses. However, some participants reported having chronic diseases (diabetes or hypertension) (10.9%), diseases of the small and large intestine (4.8%), chronic respiratory diseases (4%), previous hernia (3%) and diseases of the pelvis (1%). Likewise, there are participants showed 69 several others previous illnesses. Most of the reported illnesses were irritable bowel syndrome (18.3%), hypothyroidism (8.2%), asthma (5.5%), anemia (3.7%), and migraine (2.3%).

Most(79.2%) of the participants were not takingregular medications. The other 20.8% of respondents were regularly taking 33 different medications; some of these medications were antidiabetic drugs (21.4%), antihypertensive drugs (13%), levothyroxine (11.1%), insulin (6.3%), and thyroid drugs (4.5%).

More than two-thirds of the participants (76.6%) had not had previous abdominal or pelvic operations. The remaining23.4% have had 39 different operations. Most of these operations were cesarean section (29.3%), appendectomy (21.8%), cholecystectomy (12.8%), hernia repair (8.5%), and bariatric surgery (5.6%). The means and standard deviations (mean ± standard deviation) of the duration and frequencies of the previous abdominal or pelvic operations among the participants were 11 ± 9 and 1 ± 1, respectively.

Previous history of intestinal obstruction

The prevalence of previous intestinal obstruction among the participants was 6.54% (n =132). This was mostly diagnosed by clinical examination (39.5%), radiological images (39.5%), and laboratory analysis (21%). The obstructions were mainly partial (98.6%) and in the small intestine (52%). The common symptoms in participants' caseswere constipation (24.9%), abdominal distension (22.8%), abdominal pain/colic (17.5%), nausea and frequent vomiting (11.2%), flatus does not come out (10.2%), diarrhea (7%), and fever (6.3%). Most of participantswere treated by anal injections (25%), intravenous fluid (IVF) with intestinal relief by NPO (23.9%), surgeries (22.7%), intravenous antibiotics (14.8%), medications to prevent nausea and vomiting (10.2%), andatube through the nose or throat to open the blockage (3.4%). A total of 87.9% of the participants did not have any treatment complications, and the remaining12.1% had complications such as complete obstruction, constipation, bleeding, diarrhea, and

pain. The distribution of intestinal obstruction frequency was: none (41.5%), 1-2 times (39%), 3-4 times (14.6%), and more than 4 times (4.9%).There were no significant associations between past bowel obstruction type and site with previous illnesses, abdominal or pelvic operations, and medications intake (p-value ≥ 0.05).

The awareness level of intestinal obstruction

The awareness level of participants about intestinal obstruction was good (7 of 13 or more) in 57.2% of our cohort, and poor (less than 7 of 13) in42.8%. Themean awareness level score was 7 ± 2. Most(91.2%) of the participants believe that there are insufficient awareness programs regarding intestinal obstruction in Saudi Arabia. Also, 87% of the participants have nevercompleted a questionnaire similar to this study's questionnaire.

The associations of intestinal obstruction awareness levels with awareness scoring questions are given in Table 1.

Table 1: Association of intestinal obstruction awareness level with sociodemographic data and previous illnesses (*n* = 2019)

Variables		Awareness level				P. value
		Good		Poor		
		n	*%*	*n*	*%*	
Gender	Female	640	31.7%	441	21.8%	***0.046***††
	Male	514	25.5%	424	21%	
Age (years) **(Mean ± SD)***		34 ± 12		33 ± 12		0.632
Age groups (years)	25-39	412	20.4%	322	15.9%	0.728
	18-24	343	17%	258	12.8%	
	40-59	339	16.8%	249	12.3%	
	+60	38	1.9%	20	1%	
	<18	22	1.1%	16	0.8%	
Residence	Central Region	324	16%	233	11.5%	0.162
	West Region	273	13.5%	198	9.8%	
	East Region	223	11%	197	9.8%	
	South Region	233	11.5%	149	7.4%	
	Northern Region	101	5%	88	4.4%	
Marital status	Married	664	32.9%	485	24%	0.899
	Single	450	22.3%	350	17.3%	
	Divorced	27	1.3%	19	0.9%	
	Widowed	13	0.6%	11	0.5%	
No. of children **(Mean ± SD)***		2 ± 3		2 ± 3		0.844

No. of children	Non	572	28.3%	429	21.2%	0.299
	Less than 4	275	13.6%	186	9.2%	
	4-6	244	12.1%	209	10.4%	
	More than 6	63	3.1%	41	2%	
Educational level	University	786	38.9%	594	29.4%	0.530
	Secondary school	210	10.4%	158	7.8%	
	Postgraduate	110	5.4%	90	4.5%	
	Intermediate school	37	1.8%	19	0.9%	
	Primary school	10	0.5%	4	0.2%	
	Uneducated	1	0%	0	0%	
Occupation	Governmental (civil)	363	18%	275	13.6%	0.057
	Student	349	17.3%	279	13.8%	
	House wife	147	7.3%	105	5.2%	
	Private sector	107	5.3%	63	3.1%	
	Retired	93	4.6%	51	2.5%	
	Governmental (military)	63	3.1%	71	3.5%	
	Free work	32	1.6%	21	1%	
Intestinal obstruction family history	No	1079	53.4%	828	41%	***0.031***††
	Yes	75	3.7%	37	1.8%	
Previous illnesses	None	774	38.3%	625	31%	***0.046***††
	Chronic diseases (DM-HTN)*	138	6.8%	90	4.5%	
	Others	128	6.3%	79	3.9%	
	Diseases of the small and large intestine	68	3.4%	32	1.6%	
	Chronic respiratory diseases	50	2.5%	33	1.6%	
	Previous hernia	35	1.7%	28	1.4%	
	Diseases of the pelvis	11	0.5%	9	0.4%	

***DM:** Diabetes mellitus **HTN:** Hypertension **SD:** Standard deviation ††**:** Statistical significant

Table 2: Association of bowel obstruction awareness level with awareness scoring questions (*n* = 2019)

Variables		Awareness level				P. value
		Good		Poor		
		n	*%*	*n*	*%*	
Causes of intestinal obstruction	Fibroblast adhesions due to previous abdominal or pelvic operations	542	26.8%	412	20.4%	0.529
	Torsion and tightness in the intestines	572	28.3%	399	19.8%	
	Congenital defects in the intestines	492	24.4%	360	17.8%	
	Intestinal tumors	444	22%	330	16.3%	
	Severe constipation	434	21.5%	306	15.2%	
	Chronic bowel inflammation such as ulcerative colitis	378	18.7%	264	13.1%	
	Genetic causes	346	17.1%	253	12.5%	
	Ingestion of solid bodies	290	14.4%	192	9.5%	
	Hernia	244	12.1%	174	8.6%	
	Gallstones	138	6.8%	89	4.4%	
Common symptoms associated with small intestinal obstruction	Colic and pain in the abdomen	810	40.1%	597	29.6%	0.554
	Abdominal distension	747	37%	556	27.5%	
	Constipation	601	29.8%	445	22%	
	Nausea and vomiting	570	28.2%	437	21.6%	
	Flatus does not come out	316	15.7%	272	13.5%	
	Diarrhea	81	4%	66	3.3%	
Common symptoms associated with large intestinal obstruction	Constipation	848	42%	454	22.5%	**000**††
	Abdominal distension	818	40.5%	430	21.3%	
	Colic and pain in the abdomen	801	39.7%	429	21.2%	
	Nausea and vomiting	481	23.8%	302	15%	
	Flatus does not come out	649	32.1%	215	10.6%	
	Diarrhea	97	4.8%	66	3.3%	
Which type requires surgical intervention?	Total	1097	54.3%	725	35.9%	**000**††
	Partial	57	2.8%	140	6.9%	

Does abdominal and pelvic surgery have a role in causing of intestinal obstruction?	No	187	9.3%	509	25.2%	**000**††
	Yes	967	47.9%	356	17.6%	
Does laparoscopy or open surgery have a role in intestinal obstruction?	No	365	18.1%	645	31.9%	**000**††
	Yes	789	39.1%	220	10.9%	
Does the abdominal and pelvic inflammation have a role in intestinal obstruction?	No	283	14%	463	22.9%	**000**††
	Yes	871	43.1%	402	19.9%	
What is the diagnosis method in intestinal obstruction?	Radiological images	935	46.3%	654	32.4%	**000**††
	Laboratory analysis	59	2.9%	118	5.8%	
	Clinical examination	160	7.9%	93	4.6%	
What is the best way to treat partial intestinal obstruction?	Change lifestyle	244	12.1%	261	12.9%	**000**††
	Surgeries	186	9.2%	212	10.5%	
	Stents are inserted by the tubes to widen the narrow intestine	231	11.4%	206	10.2%	
	IVF with intestinal relief by NPO	292	14.5%	115	5.7%	
	Tube through the nose or throat to open the obstruction by removing the causative agent	201	10%	71	3.5%	
What is the best way to treat total intestinal obstruction?	Surgeries	865	42.8%	491	24.3%	**000**††
	Stents are inserted by the tubes to widen the narrow intestine	93	4.6%	139	6.9%	
	Change lifestyle	64	3.2%	132	6.5%	
	IVF with intestinal relief by NPO	66	3.3%	63	3.1%	
	Tube through the nose or throat to open the obstruction by removing the causative agent	66	3.3%	40	2%	
Causes of intestinal obstruction recurrence	Chronic constipation	661	32.7%	461	22.8%	**000**††
	Intestinal twisting	614	30.4%	386	19.1%	
	Presence of tumors in the intestine	601	29.8%	367	18.2%	
	Congenital defects in the intestines	449	22.2%	268	13.3%	
	Chronic inflammatory bowel disease	343	17%	190	9.4%	
	Swallowing solid objects	325	16.1%	177	8.8%	

	Passage a large stone from gallbladder to intestines due to the adhesion of gallbladder to intestines	277	13.7%	151	7.5%	
	Intussusception	332	16.4%	140	6.9%	
	Presence of hernia	312	15.5%	104	5.2%	
	Some antidepressants or analgesics	120	5.9%	100	5%	
	Previous operations	506	25.1%	92	4.6%	
	Frequent vomiting	130	6.4%	55	2.7%	
	Postoperative anesthesia problems	111	5.5%	52	2.6%	
Complications if not treated	Dryness of the body	542	26.8%	399	19.8%	
	Failure with other body organs	593	29.4%	384	19%	
	Intestinal tissue necrosis and ischemia	529	26.2%	363	18%	**000††**
	Death	588	29.1%	349	17.3%	
	Perforated bowel	485	24%	335	16.6%	
	Infection translocate to blood	324	16%	220	10.9%	
Prevention of intestinal obstruction	Maintaining a healthy lifestyle	833	41.3%	570	28.2%	
	Keep eating healthy food like eating fiber and staying away from fat	832	41.2%	546	27%	
	Check with your doctor if you have diseases that may lead to an intestinal obstruction	804	39.8%	511	25.3%	**000††**
	If surgery is required, choose surgeon can perform laparoscopic surgery if possible	501	24.8%	347	17.2%	

IVF: Intravenous fluid **NPO:** Nothing by mouth ††: Statistical significant

DISCUSSION:

Many studies have reported that the prevalence of intestinal obstruction is more common in malesthan females, which might be because of the slightly higher incidence of volvulus, obstructed inguinal hernia, and malignant disease of the gastrointestinal tract in males. **(Adhikari et al.,2010 ; Khayat et al.,2014)**

Our data indicate that family history is unrelated to the occurrence of an intestinal obstruction, which is consistent with the literature.

In our cohort, previous diseases were not associated with the occurrence of intestinal obstruction. However, other studies have identified relationships betweenintestinal obstruction and neoplasms,herniation and lower abdominal surgery (including colorectal surgery), appendectomies, hernia repairs, and gynecologic procedures. **(Agbo et al.,2016 ; Jackson et al.,2011)**

In our respondents, the most common symptoms of large bowel obstruction were constipation (42%) and abdominal distention (40.5%). This corresponds well with the study by Saravanan (2016). These findings

show that the surgical intervention is essential in case of complete intestinal obstruction (54.3%).Similar findingshave been reported in other studies.Paulson et al. (2015) andBarnett et al. (2013)also report that surgical intervention is important in patients with complications (such as vascular compromise, coexistent strangulation or perforation) and that fail to respond to nasogastric tube decompression. **(Barnett et al.,2013 ; Paulson et al., 2015 ; Saravanan et al.,2016).**

Forty-eight percent of our participants believed that abdominal and pelvic surgery have a role in causing intestinal obstruction and 39.1% believed that laparoscopic and open operations could cause an intestinal obstruction. In the studies of Parkeret al. (2004) and Beck(2006),the incidence of peritoneal adhesions after abdominal and pelvic open surgery was between 54% and 90%. There is a 5-9% risk of readmission directly after lower abdominal surgery, which is related to adhesions (Parkeret al.,2005; Ten Broek et al.,2013) and laparoscopic techniques for abdominal and pelvic surgery were all found to have a lower incidence of adhesion-related readmissions (Schnürigeret al.,2011). **(Beck et al.,2006 ; Parker et al., 2004 ; Parker et al.,2005; Schnürigeret al.,2011 ; Ten Broek et al.,2013)**

In our study, 43.1% of the participants believedthat abdominal and pelvic inflammation has a role in causing intestinal obstruction.Katsanos et al.(2010)also stated that intestinal obstruction represents a severe complication and a potential emergency in inflammatory bowel disease . **(Katsanos et al.,2010)**

Pre-operative diagnosis is difficult becauseclinical findings are often unreliable. However, we believe that radiological findings can differentiate between IO and non-IO cases. In the study the clinical (39.5%) and radiological (39.5%) findings were the most specific and sensitive for the disease then laboratory findings (21%) comes after that because it's considered as a predictive factor for possible complications. **(Al Salamah et al.,2012)**

Regarding the management, laparotomy was the most definitive method for patients with complete intestinal obstruction, while others can be treated conservatively in case of partial obstruction. Some studies indicate that most of the patients can be managed non-operatively but in our study the results showed that higher rates of surgical management about (52%) of patients with partial (9.2%) and complete (42.8%) intestinal obstruction had undergone surgical management as a definitive treatment. **(Al-Mulhim2014)**

In this study, most of our participants choose chronic constipation as the most common cause of intestinal obstruction recurrence (32.7%), while other reports have suggested that the most common cause of recurrence is adhesions due to previous abdominal or pelvic surgeries with (45.6%) . **(Halis et al., 2012)**

Death and complications prevalence rates varyacross studies.Advanced age, comorbidity, admission time to the hospital, and surgical procedures are risk factors for morbidity and mortality. Our study revealed the absence of treatment complications for most of them, only 12.1% presented with complications after treatment. In untreated patients high rates of morbidity[suchas dehydration (26.8%), bowel perforation (24%), ischemia (26.2%), septicemia (16%), failure body organs (29.4%)] and mortality (29.1%) can occur as a consequences of treatment delay of more than 24 h . **(Al-Mulhim2014; Fevang et al.,2000)**

Appropriate maintenance of healthy and/or lifestyle changes (41.3%), checking with the doctor for the presence of diseases that might lead to an intestinal obstruction (39.8%) and if surgery is required for any reason better to choose a surgeon who can perform laparoscopic surgery if possible (24.8%) were some of the preventive methods against intestinal obstruction.

CONCLUSION:

Here we aimed to assess the awareness and attitude of the Saudi population toward intestinal obstruction.The awareness level of our participants was good in 57.2% of our cohort, and poor in 42.8%. Most of the participants believed that colicky pain and constipation are the most common symptoms associated with small and large bowel obstruction, respectively. while torsion and tightness in the intestines is the cause of the obstruction and consider that previous abdominal operations and inflammatory bowel disease had a role in causing intestinal obstruction. Also, the respondents believe that the best way to treat the obstruction is surgical interventionandthat death is the only likely complication if the conditionisnot treated.

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