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ASSESSMENT OF KNOWLEDGE AND PRACTICE OF EPISTAXIS FIRST AID MANAGEMENT AMONG SAUDI POPULATION: A CROSS-SECTIONAL STUDY

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ABSTRACT

Epistaxis, one of the most common Otolaryngology emergencies, refers to bleeding from the nose, nasal cavity, or nasopharynx. 90%–95% of nosebleeds can be managed using first-aid procedures like tilting the patient's head forward and applying digital compression to the nasal alae and anterior septal area. Epistaxis is typically a benign, self-limiting, spontaneous disorder that can be treated at home. The aim of this study to evaluate the knowledge, and practice of the Saudi population regarding the first aid management of epistaxis. A Cross-sectional study was conducted in KSA, including both adult males and females, who participated in a pre-validated questionnaire that consisted of 22 questions on the knowledge and practice assessment. The study included 1750 participants, 52.7% of them were females and 47.3% were males. 78.8% of the respondents reported experiencing epistaxis. A significant portion of individuals possess only poor knowledge, accounting for 26.9% of the total. On the other hand, those with moderate knowledge make up 48.3%, indicating a larger proportion of individuals falling into this category. Lastly, individuals with good knowledge represent 24.8% of the population. As for practice, 64.9% of participants had poor practice, 32.6% had moderate practice, and 2.5% had good practice score. In conclusion, the study shows low knowledge and practice levels from the Saudi population towards first aid of epistaxis. Results show statistically significant associations between knowledge scores and factors such as age, gender, nationality, location, education level, and occupation. Practice scores were only significantly associated with the age and occupation of participants.

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Introduction

Acute bleeding from the nose, nasal cavity, or nasopharynx is referred to as epistaxis [1]. It is one of the most frequent ENT emergencies [2]. There are two major types: the anterior, which is the most prevalent, and the posterior, which is less common and more likely to necessitate medical attention [3]. First-aid measures include tilting the patient's head forward and applying digital compression to the nasal alae and anterior septal area can prevent 90%-95% of nosebleeds [4]. Epistaxis is usually a spontaneous, benign, and self-limiting condition that can be treated at home [5]. Furthermore, epistaxis is a frequent disease that can have significant consequences in humans. An estimated 60% of the population is anticipated to experience at least 1

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episode of epistaxis during their lifetime, and 6% are anticipated to seek medical care for it [6]. More typical in children and young adults, and extremely uncommon in newborns [7]. Moreover, according to statistics, 49% of Saudi Arabia's population reported having epistaxis [8]. Epistaxis has been associated with male gender, advanced age, and cardiovascular illness [9]. In 2018, a cross-sectional study was carried out in Saudi Arabia. It aimed to determine the general Saudi population's current knowledge of the first-aid management of epistaxis and misunderstandings about it. 78.8% of those surveyed have had personal experience with epistaxis. The center region had 60.1% of the participants, which was thought to be a study gap [10]. Cross-sectional research was carried out in 2020. It is designed to evaluate the knowledge, attitude, and practice of epistaxis management among the populace in various Saudi Arabian regions. According to the study, most participants tried to stop the bleeding by shifting their heads. One of the study's disadvantages was that it was only done in several Saudi regions [7]. A cross-sectional study was carried out in Al Majmaah City, Saudi Arabia, in 2023 to assess the general public's knowledge, awareness, and attitude (myths) on the first aid management of epistaxis. The survey found that 94% of people knew the correct position that patients with epistaxis needed to reduce bleeding. The only city in which the research was done was Al Majmaah, and the ratio of female to male participants was significantly different [1]. The previous studies on the knowledge and practice of epistaxis first aid in Saudi Arabia have been limited in scope, with small sample sizes and a focus on specific regions of the country. This study was done to provide a more comprehensive and accurate assessment of the knowledge and practice of epistaxis first aid among the general population of Saudi Arabia. To do this, the study used a larger sample size and collected data from a wider range of regions in the country. The results of this study were important for improving the management of epistaxis in Saudi Arabia and for developing more effective public health interventions. This study aimed to evaluate the knowledge, and practice of the Saudi population regarding the management of epistaxis.

Study Objective

To assess the knowledge and practice level of epistaxis first aid among the general population in Saudi Arabia.

Materials and Methods

Study Design

A cross-sectional study was conducted on the general public Saudi population including both males and females.

Inclusion and Exclusion Criteria

Adult males and females who are older than 18 from all social classes were included. Saudi adults younger than 18 and older than 85 were excluded.

Sample Size

Using the Raosoft tool, we calculated the minimal sample size for this study, which came out to be 377. We assumed an estimated 95 percent confidence level and a 5 percent margin of error.

Method for data collection and instrument (Data collection Technique and tools):

The study was conducted using a structured questionnaire as a study tool. We developed the tool after reviewing relevant articles conducted in Saudi Arabia and the final version of the questionnaire consists of 29 questions divided into three sections. The first section contained socio-demographic background characteristics questions. The second section included questions about the knowledge of epistaxis first aid. The final section consists of questions regarding the practice of epistaxis first aid. The survey was disseminated via social media by medical students who served as data collectors.

Scoring System

We used a total of 22 questions from our survey to evaluate participants' degree of knowledge and practice with epistaxis first aid.

Score on Knowledge

There are 11 questions in the knowledge section. The right answer scored one point, whereas the wrong answer or "I don't know" responses scored zero. A score of 9 indicated a high degree of knowledge, a score of 6 to 8 indicated a medium level of knowledge, and a score of less than 6 indicated a poor level of knowledge.

Practice Score

The practice part has 11 questions. The right answer scored one point, whereas the wrong answer or "I don't know" responses scored zero. A score of 9 denoted excellent practice, a score of 6 to 8 was considered medium practice, and a score of less than 6 was considered bad practice.

Pilot Test

20 people were given the questionnaire and asked to complete it. This was done to evaluate the study's viability and how straightforward the questionnaire was. Data from the pilot study were not included in the analysis's final results.

Analyzes and Entry Method

The obtained data was recorded into an Excel 2021 spreadsheet and then uploaded to the analysis tool SPSS (Statistical Package of Social-Science Software) to be statically analyzed.

Results and Discussion

Table 1 shows that the majority of participants fall within the 21-30 age group, accounting for 49.5% of the population, followed by the 31-40 age group at 18.4%. Gender distribution shows a relatively equal split, with 52.7% female and 47.3% male. The majority of the population, 84.5%, is Saudi, while 15.5% are non-Saudi. When it comes to location, the central region has the highest representation at 35.7%, followed by the southern area at 21.8%. In terms of education level, the majority of the population has obtained a bachelor's degree, accounting for 57.7%, followed by high school level at 29.3%. The occupation breakdown shows that 38.0% of the population is employed, while 36.5% are students. In terms of marital status, the majority of the population, 52.2%, is single, followed by 44.0% who are married.

Table 1. Sociodemographic characteristics of participants (n=1750)

Parameter		No.	%
Age	18 - 20	213	12.2
	21- 30	867	49.5
	31- 40	322	18.4
	41- 50	237	13.5
	51 -- 60	111	6.3
Gender	Male	827	47.3
	Female	923	52.7
Nationality	Saudi	1479	84.5
	Non-Saudi	271	15.5
Location	Southern area	381	21.8
	Eastern Province	125	7.1
	The northern area	302	17.3
	Western Region	318	18.2
	Central Region	624	35.7
Education Level	No formal education	9	.6
	Primary	16	.9
	Secondary	34	1.9
	High school level	512	29.3
	Bachelors	1009	57.7
	Postgraduate	170	9.7
Occupation	Employed	665	38.0
	student	638	36.5
	Unemployed	276	15.8
	retired	51	2.9
	Other	120	6.9
Marital Status	Married	770	44.0
	Single	914	52.2
	Divorced	52	3.0
	Widowed	14	.8

According to **Table 2**, 78.8% of the respondents reported experiencing epistaxis. The majority of the cases were related to the nose (95%), while only 2.3% were related to the ear, and 0.3% were related to the eyes. When it comes to first aid administration, only 35.2% of the respondents reported receiving any training or awareness program. The majority (60.2%) reported not receiving any training, while 4.6% were unsure. There are different types of epistaxis, with anterior nosebleeds and posterior nosebleeds being the most common (29.7%). Lateral nosebleeds and posterior nosebleeds were reported by 7.6% of the respondents, while 4.2% reported early and subsequent nosebleeds. The majority (58.5%) reported not knowing about the different types of nosebleeds. Weather was considered a possible factor in causing epistaxis by 68.2% of the respondents.

However, 12.8% did not agree, and 19.0% were unsure. Injury, exposure to shocks or blows, was reported as the major cause of epistaxis by 62.2% of the respondents. Only 4.8% reported digestive system problems as the cause, while 33.0% were unsure. Possible risk factors for epistaxis were identified as local injury to nasal blood vessels, anti-coagulant medication, prolonged use of NSAIDs or steroidal nasal sprays, traditional drugs or supplements, hypertension, GIT problems, exposure to rain, and vitamin-D deficiency. However, the majority (46.5%) reported not knowing about the possible risk factors. Regarding medications and epistaxis, 45.9% of the respondents believed that some medications could cause nosebleeds, while 10.6% believed that they could not. The rest (43.5%) were unsure. Excess nose manipulation was identified as a possible cause of epistaxis by 50.7% of the respondents. However, 21.7% believed that it could not cause nosebleeds, while 27.5% were unsure.

Table 2. Knowledge of participants of epistaxis (n=1750).

Parameter		No.	Percent
Heard /witnessed /experienced epistaxis	Yes	1379	78.8
	no	294	16.8
	I'm not sure	77	4.4
Epistaxis is bleeding from…	ear	40	2.3
	the nose	1663	95.0
	The eyes	6	.3
	I don't know	41	2.3
Received any training or awareness program on first aid administration	Yes	616	35.2
	no	1053	60.2
	I'm not sure	81	4.6
Major types of epistaxis	Anterior nosebleeds and posterior nosebleeds	520	29.7
	Lateral nosebleeds and posterior nosebleeds	133	7.6
	Early and subsequent nosebleeds	74	4.2
	I don't know what types of nosebleeds are	1023	58.5
The weather has something to do with epistaxis	I agree	1194	68.2
	I do not agree	224	12.8
	I'm not sure	332	19.0
Major causes of epistaxis	Injury (exposure to shocks or blows)	1089	62.2
	Digestive system problem	84	4.8
	I'm not sure	577	33.0
Possible risk factors for epistaxis	Local injury to nasal blood vessels	1003	57.3
	Anti-coagulant medication	342	19.5
	Prolonged use of NSAIDs or steroidal nasal sprays	785	44.9
	Traditional drugs or supplements	497	28.4
	Hypertension	128	7.3
	GIT problem	114	6.5
	Exposure to rain	46	2.6
	Vitamin-D deficiency	137	7.8
	I don't know	543	31.0
Some medications can cause epistaxis	Yes	804	45.9
	no	185	10.6
	I don't know	761	43.5
Excess Nose Manipulation can cause Epistaxis	Yes	888	50.7
	no	380	21.7
	I don't know	482	27.5

Regarding the first parameter in **Table 3**, which suggests that pressing on the nose can stop epistaxis, the majority of respondents (59.5%) agreed with this statement. However, a significant number of respondents (21.8%) disagreed, and a smaller percentage (18.7%) claimed uncertainty on the matter. The next parameter discusses the best position to adopt when attempting to stop nose bleeding. According to the data, a considerable number of respondents (53.2%) believe that bending

the head forward is the most effective position. On the other hand, a significant proportion (33.2%) suggested tilting the head back, while a smaller percentage (10.2%) expressed uncertainty. The data indicates that a substantial number of respondents (47.3%) believe that all of the options provided, including sitting with a head tilt and applying pressure on the nose, are essential steps. Additionally, a significant proportion of respondents (17.8%) suggested applying pressure on the nose alone. Other options, such as applying ice or expressing uncertainty, received lower percentages of responses. Determining the appropriate duration for nose pinching is another important consideration. The data reveals that the majority of respondents (38.1%) believe that nose pinching should be performed for a duration of 2-5 minutes. A significant proportion (28.6%) suggested a duration of 5-10 minutes, while a smaller percentage (3.5%) recommended 15-20 minutes. A considerable number of respondents (29.8%) expressed uncertainty regarding the appropriate duration of nose pinching. The next parameter addresses which part of the nose should be pinched to stop nose bleeding. The majority of respondents (43.5%) suggested that the cartilaginous part of the nose should be pinched. A significant proportion (18.6%) suggested pinching both the bone and cartilaginous parts, while a smaller percentage (13.4%) recommended pinching the bone part. A considerable number of respondents (24.5%) expressed uncertainty on this matter. According to the majority of respondents (53.3%), it is allowed to breathe through the mouth while avoiding swallowing blood. However, a small percentage of respondents (8.3%) suggested that breathing should be stopped while pressing the nose. Another fraction of respondents (7.4%) claimed that breathing should be maintained with the help of an oxygen machine, while a significant proportion (31.0%) expressed uncertainty. Sucking an ice lolly as a method to reduce nose bleeding is another point of discussion. The data reveals that a considerable number of respondents (30.5%) agreed that sucking an ice lolly can help in reducing nose bleeding. However, a significant proportion (25.8%) disagreed, and a considerable percentage (43.7%) expressed uncertainty regarding this method. The next parameter suggests that icing on the neck region may aid in the management of epistaxis. According to the data, a significant number of respondents (22.6%) agreed with this statement. However, a larger proportion (34.2%) disagreed, and a considerable percentage (43.2%) expressed uncertainty on this matter. Furthermore, the data indicates that cooling or icing can assist in reducing blood flow from the nose. The majority of respondents (57.5%) agreed with this statement, while a smaller percentage (12.6%) disagreed. A considerable proportion (29.9%) expressed uncertainty regarding the effectiveness of cooling or icing in reducing nose bleeding. If cooling or icing is deemed beneficial, the data suggests that the nose and back of the neck are the parts that should be applied with icing to stop bleeding, according to the majority of respondents (47.7%). Other options, such as applying icing to the knees and elbows or the palms and feet, received significantly lower percentages of responses. A considerable number of respondents (42.6%) expressed uncertainty regarding which parts should be applied with icing. The average time in which nose bleeding is expected to stop after first-aid management is another aspect addressed in the data. According to the majority of respondents (56.5%), nose bleeding is anticipated to stop within 10 minutes. A smaller percentage (16.5%) suggested a duration of 20 minutes, while a significantly smaller proportion (1.4%) recommended a duration of 45 minutes. A considerable number of respondents (25.7%) expressed uncertainty regarding the average time it takes for nose bleeding to stop. Finally, if the bleeding does not stop within a certain timeframe, the data suggests that the patient must be moved to a specific location. The majority of respondents (65.5%) recommended transferring the patient to the hospital after 20 minutes if the bleeding does not stop. A smaller percentage (12.1%) suggested transporting the patient to surgery after 10 minutes, while a significantly smaller proportion (1.7%) recommended that the patient go to sleep after 30 minutes. A considerable number of respondents (20.7%) expressed uncertainty regarding the appropriate course of action if the bleeding does not stop within the specified timeframe.

Table 3. Participants knowledge and practice towards first aid of epistaxis (n= 1750)

Parameter		No.	Percent
Pressing on the nose can stop epistaxis	Yes	1041	59.5
	no	382	21.8
	I don't know	327	18.7
Best positions to stop epistaxis	Lie down and raise your feet	60	3.4
	Head bending forward	931	53.2
	Head tilted back	581	33.2
	I don't know	178	10.2
Primary step for epistaxis first-aid management	Sitting and head tilt	235	13.4
	Pressure on the nose	311	17.8
	all of the above	828	47.3
	Apply ice	141	8.1
	I'm not sure	235	13.4
Right duration of nose pinching to be performed	2-5	666	38.1
	5-10	500	28.6
	15-20	62	3.5

	I'm not sure	522	29.8
Part of the nose shall be pinched with fingers to stop nose bleeding	Bone part	234	13.4
	Cartilaginous part	762	43.5
	both of them	326	18.6
	I'm not sure	428	24.5
Care should be taken for breathing during nose pinching	It is allowed to breathe through the mouth while avoiding swallowing blood	933	53.3
	We stop breathing while pressing the nose	146	8.3
	It is maintained with the help of an oxygen machine	129	7.4
	I don't know	542	31.0
Sucking an ice lolly can help in the reduction of nose bleeding	Yes	534	30.5
	no	451	25.8
	I'm not sure	765	43.7
Icing on the neck region may help in the management of epistaxis	Yes	396	22.6
	no	598	34.2
	I'm not sure	756	43.2
Cooling or icing can help reduce blood flow from the nose	Yes	1007	57.5
	no	220	12.6
	I'm not sure	523	29.9
If yes, which parts shall be applied with icing to stop bleeding	The nose and back of the neck	835	47.7
	Knees and elbows	27	1.5
	Palms and feet	77	4.4
	all of the above	66	3.8
	I'm not sure	745	42.6
Average time in which nose bleeding shall stop after first-aid management (minutes)	10	989	56.5
	20	288	16.5
	45	24	1.4
	I'm not sure	449	25.7
If the bleeding doesn't stop within _ minutes, the patient must be moved to __?	10 minutes - Transport him to surgery	212	12.1
	20 minutes - transferred to the hospital	1146	65.5
	30 minutes - goes to sleep	29	1.7
	I don't know	363	20.7

It is evident in **Figure 1** that a significant portion of individuals possess only poor knowledge, accounting for 26.9% of the total. On the other hand, those with moderate knowledge make up 48.3%, indicating a larger proportion of individuals falling into this category. Lastly, individuals with good knowledge represent 24.8% of the population.

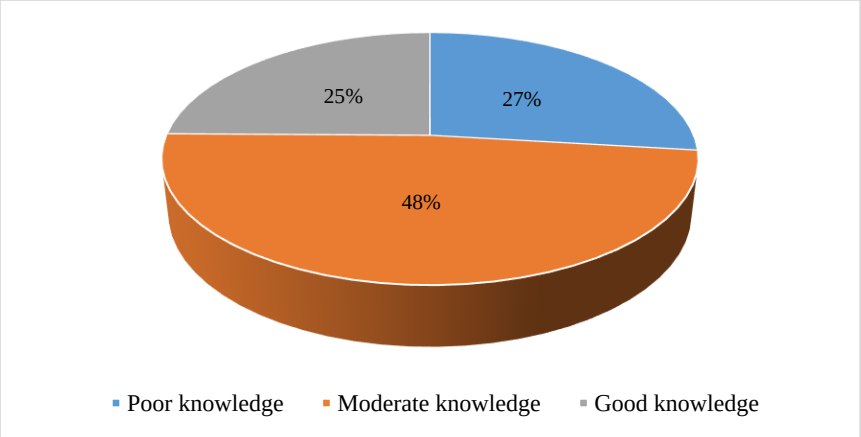

Figure 1. Participants'' knowledge scores of epistaxis

In **Figure 2**, 64.9% of participants had poor practice, 32.6% had moderate practice, and 2.5% had good practice scores.

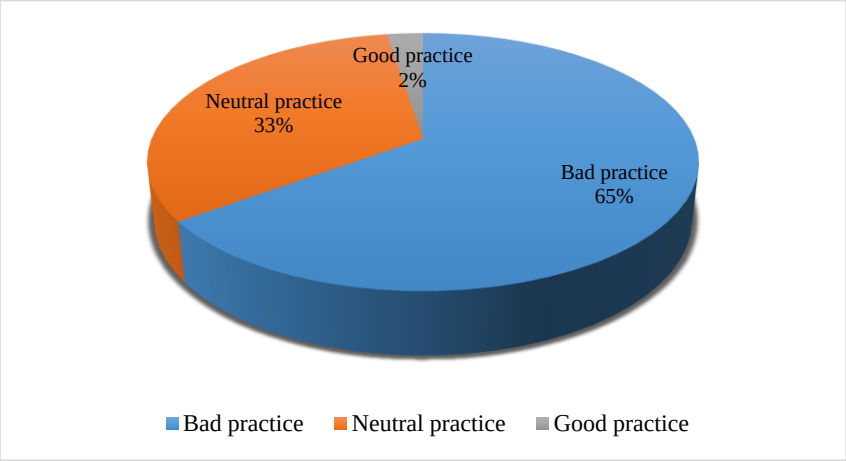

Figure 2. Participants practice scores towards epistaxis

The provided data in **Table 4** presents a breakdown of knowledge scores based on various factors such as age, marital status, gender, nationality, location, education level, and occupation. The highest percentage of good knowledge is found among individuals aged 21-30 (49.5%), followed by those aged 31-40 (18.4%). Similarly, married individuals (44.0%) and females (52.7%) tend to have a higher percentage of good knowledge compared to other categories within their respective factors. Furthermore, Saudi nationals (84.5%) and individuals residing in the southern area (21.8%) exhibit a higher proportion of good knowledge. In terms of education level, individuals with a bachelor's degree (57.7%) have the highest percentage of good knowledge, while those with no formal education (0.5%) have the lowest. Regarding occupation, employed individuals (38.0%) and students (36.5%) demonstrate a higher percentage of good knowledge compared to other categories. It is worth noting that the data shows statistically significant associations (indicated by p-values) between knowledge scores and factors such as age, gender, nationality, location, education level, and occupation.

Table 4. Knowledge scores in association with sociodemographic characters of participants

		Knowledge score			Total (N=1750)	P value
		Poor knowledge	Moderate knowledge	Good knowledge		
Age	18 -20	56	122	35	213	0.077
		3.2%	7.0%	2.0%	12.2%	
	21 -30	243	401	223	867	
		13.9%	22.9%	12.7%	49.5%	
	31 - 40	84	156	82	322	
		4.8%	8.9%	4.7%	18.4%	
	41- 50	65	108	64	237	
		3.7%	6.2%	3.7%	13.5%	
	51 -60	23	58	30	111	
		1.3%	3.3%	1.7%	6.3%	
Marital status	Single	247	440	227	914	0.963
		14.1%	25.1%	13.0%	52.2%	
	Married	208	372	190	770	
		11.9%	21.3%	10.9%	44.0%	
	Divorced	11	27	14	52	
		0.6%	1.5%	0.8%	3.0%	
	widow	5	6	3	14	
		0.3%	0.3%	0.2%	0.8%	
Gender	Male	243	375	209	827	0.039
		13.9%	21.4%	11.9%	47.3%	
	Female	228	470	225	923	
		13.0%	26.9%	12.9%	52.7%	

Nationality	Saudi	415	698	366	1479	0.030
		23.7%	39.9%	20.9%	84.5%	
	Non-Saudi	56	147	68	271	
		3.2%	8.4%	3.9%	15.5%	
Location	Southern area	95	149	137	381	0.001
		5.4%	8.5%	7.8%	21.8%	
	Eastern Province	33	69	23	125	
		1.9%	3.9%	1.3%	7.1%	
	The northern area	83	141	78	302	
		4.7%	8.1%	4.5%	17.3%	
	Western Region	102	166	50	318	
		5.8%	9.5%	2.9%	18.2%	
	Central Region	158	320	146	624	
		9.0%	18.3%	8.3%	35.7%	
Education Level	No formal education	4	4	1	9	0.001
		0.2%	0.2%	0.1%	0.5%	
	Primary	2	12	2	16	
		0.1%	0.7%	0.1%	0.9%	
	Secondary	13	13	8	34	
		0.7%	0.7%	0.5%	1.9%	
	High school level	153	255	104	512	
		8.7%	14.6%	5.9%	29.3%	
	Bachelors	267	491	251	1009	
		15.3%	28.1%	14.3%	57.7%	
	Postgraduate	32	70	68	170	
		1.8%	4.0%	3.9%	9.7%	
Occupation	Employed	154	306	205	665	0.001
		8.8%	17.5%	11.7%	38.0%	
	student	170	317	151	638	
		9.7%	18.1%	8.6%	36.5%	
	Unemployed	95	135	46	276	
		5.4%	7.7%	2.6%	15.8%	
	retired	12	28	11	51	
		0.7%	1.6%	0.6%	2.9%	
	Other	40	59	21	120	
		2.3%	3.4%	1.2%	6.9%	

Table 5 provides information on the practice scores based on different variables such as age, marital status, gender, nationality, location, education level, and occupation. Starting with age, the table shows that respondents aged 18-20 had the lowest percentage of good practice scores (0.3%), while those aged 21-30 had the highest percentage (0.7%). The p-value of 0.001 indicates a significant difference in practice scores across age groups. Moving on to marital status, the table reveals that single individuals had the highest percentage of good practice scores (0.9%), followed by married individuals (1.5%). The p-value of 0.223 suggests that there is no significant difference in practice scores based on marital status. In terms of gender, both males and females had similar percentages of good practice scores (1.1% and 1.4% respectively). The p-value of 0.818 indicates that there is no significant difference in practice scores between genders. When considering nationality, Saudi respondents had a higher percentage of good practice scores (1.8%) compared to non-Saudi respondents (0.6%). However, the p-value of 0.139 suggests that this difference is not statistically significant. Looking at location, the table shows that respondents from the southern area had the highest percentage of good practice scores (0.7%), while those from the eastern province had the lowest (0.2%). However, the p-value of 0.828 suggests that there is no significant difference in practice scores based on location. Examining education level, respondents with a bachelor's degree had the highest percentage of good practice scores (1.4%), followed by those with a postgraduate degree (0.2%). The p-value of 0.166 indicates that there is no significant difference in practice scores based on education level. Finally, analyzing occupation, employed individuals had the highest

percentage of good practice scores (1.0%), while retired individuals had the lowest (0.2%). The p-value of 0.004 suggests that there is a significant difference in practice scores based on occupation.

Table 5. Practice scores in association with sociodemographic characters of participants.

		Practice Score			Total (N=1750)	P value
		Bad Practice	**Neutral Practice**	**Good practice**		
Age	18 -20	139	69	5	213	0.001
		7.9%	3.9%	0.3%	12.2%	
	21 -30	611	243	13	867	
		34.9%	13.9%	0.7%	49.5%	
	31 - 40	201	113	8	322	
		11.5%	6.5%	0.5%	18.4%	
	41- 50	124	99	14	237	
		7.1%	5.7%	0.8%	13.5%	
	51 -60	61	47	3	111	
		3.5%	2.7%	0.2%	6.3%	
marital status	Single	612	287	15	914	0.223
		35.0%	16.4%	0.9%	52.2%	
	Married	484	260	26	770	
		27.7%	14.9%	1.5%	44.0%	
	Divorced	31	19	2	52	
		1.8%	1.1%	0.1%	3.0%	
	widow	9	5	0	14	
		0.5%	0.3%	0.0%	0.8%	
Gender	Male	533	275	19	827	0.818
		30.5%	15.7%	1.1%	47.3%	
	Female	603	296	24	923	
		34.5%	16.9%	1.4%	52.7%	
Nationality	Saudi	968	479	32	1479	0.139
		55.3%	27.4%	1.8%	84.5%	
	Non-Saudi	168	92	11	271	
		9.6%	5.3%	0.6%	15.5%	
Location	Southern area	253	116	12	381	0.828
		14.5%	6.6%	0.7%	21.8%	
	Eastern Province	85	37	3	125	
		4.9%	2.1%	0.2%	7.1%	
	The northern area	191	102	9	302	
		10.9%	5.8%	0.5%	17.3%	
	Western Region	199	112	7	318	
		11.4%	6.4%	0.4%	18.2%	
	Central Region	408	204	12	624	
		23.3%	11.7%	0.7%	35.7%	
Education Level	No formal education	6	3	0	9	0.166
		0.3%	0.2%	0.0%	0.5%	
	Primary	10	6	0	16	
		0.6%	0.3%	0.0%	0.9%	
	Secondary	23	10	1	34	
		1.3%	0.6%	0.1%	1.9%	
	High school level	344	154	14	512	

		19.7%	8.8%	0.8%	29.3%	
	Bachelors	663	322	24	1009	
		37.9%	18.4%	1.4%	57.7%	
	Postgraduate	90	76	4	170	
		5.1%	4.3%	0.2%	9.7%	
Occupation	Employed	403	244	18	665	0.004
		23.0%	13.9%	1.0%	38.0%	
	student	444	184	10	638	
		25.4%	10.5%	0.6%	36.5%	
	Unemployed	190	80	6	276	
		10.9%	4.6%	0.3%	15.8%	
	retired	28	20	3	51	
		1.6%	1.1%	0.2%	2.9%	
	Other	71	43	6	120	
		4.1%	2.5%	0.3%	6.9%	

Epistaxis, commonly known as a nosebleed, is a common medical condition that can occur spontaneously or as a result of trauma or underlying health conditions. Individuals need to have knowledge and practice of first aid management for epistaxis, as it can help prevent complications and provide immediate relief to the affected individual. In the Saudi population, it is crucial to assess the level of knowledge and practice of epistaxis first aid management, as it can aid in the development of targeted educational programs and interventions to improve public health outcomes [1, 4, 11].

Looking at the global prevalence of epistaxis, 78.8% of our study respondents reported experiencing epistaxis and 35.5% received training or awareness programs on first aid administration. The results of other studies carried out in Saudi Arabia and abroad [1, 12, 13] were mirrored in this study, which was higher than that reported in a prior Saudi study because only 60% of the participants had prior experience with the condition, and only half (52%) had received first aid training for managing epistaxis. 67% of people in Alhassa, Saudi Arabia, reported having epistaxis in the past, and 54% said they had heard about first aid for the condition [13]. 79.86% of individuals in Al-Majmaah, Saudi Arabia, reported having epistaxis at least once in their lifetime [1]. Large-scale public health programs are required to overcome this substantial gap, which is the lack of public first aid education on common medical situations.

The majority of our participants identified epistaxis as bleeding in the nose (95%), while only 2.3% were related to the ear, and 0.3% were related to the eyes. Injury, exposure to shocks or blows, was reported as the major cause of epistaxis by 62.2% of the respondents. Only 4.8% reported digestive system problems as the cause, while 33.0% were unsure. This was higher than Saudi study reported that most could identify epistaxis as bleeding from the nose (91.8%) and correctly pinpoint its origin in the inner nasal region (57.6%) [11]. However, recognizing trauma as the most common cause was low at 42.3%, while medications were rarely identified as risk factors [11]. According to our data, a considerable number of respondents (53.2%) believe that bending the head forward is the most effective position. On the other hand, a significant proportion (33.2%) suggested tilting the head back, while a smaller percentage (10.2%) expressed uncertainty. Another study found that less than half knew the appropriate steps for head positioning, nasal compression, and icing [11]. There were more gaps in the public's knowledge regarding the causes, risk factors, and early management of epistaxis in the Jazan region when it came to the duration of interventions and indications for medical care. This conclusion is in line with previous research [1, 13]. 4.4% and 4.9% of people in Al-Majmaah, Saudi Arabia, reported having it as a result of nail and nasal injuries, respectively. For 7.6% of patients, bleeding disorders were the primary cause of epistaxis, whereas for 23%, hypertension was the primary reason [1]. Some plausible explanations for these discrepancies could be insufficient instruction in schools, public health campaigns promoting first aid for common medical crises like epistaxis, and cultural misunderstandings regarding do-it-yourself cures.

According to our results, a significant portion of individuals possess only poor knowledge, accounting for 26.9% of the total. On the other hand, those with moderate knowledge make up 48.3%, indicating a larger proportion of individuals falling into this category. Lastly, individuals with good knowledge represent 24.8% of the population. This was in line with the findings of a 2019 study by Al-Kubaisy *et al*. [14] that examined instructors' understanding of managing epistaxis. According to reports, just one-third of the teachers were well-versed in managing epistaxis, particularly those who had previously studied first aid for the condition. Similar to Al-Kubaisy's findings, Alshehri *et al*. [13] also revealed insufficient awareness among teachers in the Alahssa region regarding the first-aid care of epistaxis. Another study by Alshehri *et al*. [12] found that schoolchildren had just a mediocre understanding of managing epistaxis in the first instance. However, certain research carried out in Saudi Arabia, particularly among those working in the health sector, indicated a moderate-to-high level of awareness regarding the first-aid care of epistaxis. These studies' findings were consistent with those of the current study. For example, according to a study by Alyahya *et al*. [15], the majority of medical students possess the necessary information to treat patients who suffer epistaxis

with first aid. However, a survey of medical interns at King Fahad Armed Force Hospital revealed that their understanding of epistaxis first aid was inadequate [16].

The current study results show statistically significant associations between knowledge scores and factors such as age, gender, nationality, location, education level, and occupation. Practice scores were only significantly associated with age and occupation of participants. In a prior Saudi study, several of sociodemographic characteristics were shown to be substantially correlated with the knowledge levels of the sample group. Compared to younger responders, older persons (above 56) demonstrated higher awareness. This could be explained by a lifetime of increased experience in controlling epistaxis occurrences. Those who were working and married also had higher knowledge, maybe as a result of having larger family responsibilities. Knowledge is logically connected with higher educational standing, underscoring the significance of literacy. Higher-educated people typically learn more and have better access to resources, which might expand their knowledge and awareness in general [11]. Another study revealed that age was a weak factor to affect the total score of KAP (P value=0.05) and being epistaxis patient or not was a factor that can affect the total score of KAP (p value=0.7) [17]. According to a different study, there is a substantial correlation (p = 0.000) between age, gender, nationality, educational attainment, and occupation and one's understanding of first-aid care of epistaxis. Saudi Arabian citizens were found to be more knowledgeable than non-Saudi citizens (92.9% vs. 35%) [18]. These findings contrast with those of Al-Kubaisy *et al*. [14], who similarly carried out their research in Riyadh, Saudi Arabia, and observed that non-Saudi citizens exhibited higher levels of knowledge. In terms of gender and work status, it was discovered that participants who were employed had greater levels of knowledge overall. Males had a substantially higher level of knowledge than females (94.7 vs. 37.6%, respectively).

Understanding the causes and risk factors associated with epistaxis is essential. The Saudi population should be aware that nosebleeds can occur due to various factors, including dry air, allergies, trauma, high blood pressure, and certain medications. By recognizing these risk factors, individuals can take preventive measures, such as using a humidifier, avoiding nasal trauma, and managing underlying health conditions, to reduce the likelihood of experiencing a nosebleed [13].

Moreover, individuals should be educated on the proper first aid measures to be taken when encountering a nosebleed. The Saudi population should be aware that the initial step in managing epistaxis is to remain calm and composed. It is important to reassure the affected individual and guide them to a seated position, leaning slightly forward to prevent blood from flowing down the throat. Applying gentle pressure to the soft part of the nose, just below the nasal bone, for a minimum of ten minutes can help control the bleeding. Additionally, individuals should be advised to avoid blowing their nose or inserting any objects into the nostrils, as these actions can aggravate the bleeding [3].

Preventive measures are also crucial in managing nosebleeds. Keeping the nasal passages moist by using a saline nasal spray or applying a thin layer of petroleum jelly inside the nostrils can help prevent dryness and minimize the risk of nosebleeds. Additionally, avoiding excessive nose picking, blowing the nose forcefully, or exposing the nose to dry air can reduce the likelihood of nosebleeds occurring [2].

Furthermore, the Saudi population should be educated on when to seek medical attention for epistaxis. While most nosebleeds can be managed effectively with first aid measures, there are instances where medical intervention is necessary. Individuals should be aware that seeking medical attention is crucial if the bleeding does not stop after applying pressure for fifteen minutes, if the nosebleed is severe and accompanied by dizziness or difficulty breathing, or if the bleeding is a result of a head injury. Recognizing these signs and symptoms can help individuals make informed decisions and seek appropriate medical care promptly.

Conclusion

In conclusion, the study shows low knowledge and practice levels from Saudi population towards first aid of epistaxis. Results shows statistically significant associations between knowledge scores and factors such as age, gender, nationality, location, education level, and occupation. Practice scores were only significantly associated with age and occupation of participants. Knowledge and practice of epistaxis first aid management among the Saudi population are crucial for promoting public health and preventing complications associated with nosebleeds. By raising awareness about the causes, risk factors, and appropriate first aid measures, individuals can effectively manage nosebleeds and seek medical attention when necessary. Conducting a comprehensive survey or study can provide valuable insights into the existing knowledge gaps, allowing healthcare professionals and policymakers to develop targeted educational programs and interventions to improve the overall health outcomes of the Saudi population.

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explaining the study in full and clarifying that participation is voluntary. Data collected were securely saved and used for research purposes only.

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