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Community Knowledge about Bleeding Control in Jazan, KSA: Is There a Need for First Aid Educational Programs

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Abstract

The current study aimed to evaluate the first aid knowledge and general awareness of bleeding control, and their relations with different variables among the population of Jazan City, Saudi Arabia, in 2023. A cross-sectional study was conducted in Jazan City, Saudi Arabia between April 2023 and May 2023. Participants, >13 years old, living in Jazan City, were self-enrolled. Data collection was carried out by distributing a self-reported online survey questionnaire via email and social media apps. A validated, pretested online self-report questionnaire was used for data collection, with data analysis performed using (MS) Excel 2022 and SPSS version 26. A Chi-square test was used to determine the association of sociodemographic variables and Bleeding Control (BC) knowledge with, significance set at $p < 0.05$. A total of 250 participants completed the questionnaire, predominantly aged between 16 - 25 years, with 152 (60.8%) being male, and about 90% being Saudi citizens. Only 53 (21.2%) participated in previous first aid training concentrating on bleeding control. Only 76 (30.4%) of participants had good knowledge, while 131 (52.4%) exhibited positive attitude towards BC first aid. There were no statistically significant associations between BC knowledge and age, gender, occupation, nationality, and education. However, a significant association was observed between previous BC training and knowledge (Chi-test =

40.373, d.f = 1, p = 0.000) at $p < 0.05$. Conclusion: The prevalence of poor knowledge of bleeding control among community members in Jazan City was high. The findings of this study should be carefully considered by various healthcare organizations to implement educational first-aid programs and activities aimed at enhancing community awareness and knowledge of bleeding control.

Keywords

Injury, Uncontrolled Bleeding, First Aid Knowledge, Attitude, Jazan City

1. Introduction

1.1. Background

Injuries claim the lives of over 4.4 million people every year around the world, accounting for 8% of the world's deaths. Approximately 29% of the overall injury-related mortality results from road traffic injuries representing roughly one-third of these deaths [1]. Injury ranks as the third leading cause of death worldwide and the leading cause of death during the first four decades of human life [2]. In the Kingdom of Saudi Arabia, road traffic accidents (RTAs) are the third leading cause of death, with a ratio of 30 deaths per 100,000 people, and the number of RTAs deaths in 2020 was 4108 males and 510 females [3]. Independent of the mechanism of injury, uncontrolled bleeding persistently appears to be the second leading cause of early death among injured individuals. It is responsible for 30% to 40% of trauma-related mortality, with 33% to 56% occur during the prehospital period [4].

Uncontrolled bleeding is defined as active massive bleeding that usually spurts out of a wound, pooling onto the ground or soaking through clothing [5]. There is evidence to support several first aid interventions that can be used to control bleeding in different circumstances to increase the survival of trauma victims. The aim of the first aid provider is to swiftly stop the bleeding [6]. Unfortunately, it was found that the normal time for emergency professionals' arrival to RTA sites, even in areas with well-established emergency services, is at least 10 minutes [7]. It is evident that without prompt first aid within this critical timeframe, many severely injured people may not survive. In such circumstances, community members, like bystanders next to the injured, are the best individuals to save the life if they have adequate knowledge about the basic skills of bleeding control [8]. However, this essential knowledge remains limited and has received little attention in many countries, including Saudi Arabia, where trauma is a common cause of death.

Determining the levels of knowledge, general awareness, as well as attitudes of community members towards bleeding control, along with their relations with different variables, could provide guidance to impart an effective and suitable

educational course tailored to the specific needs of the population in the country [9]. Moreover, there is a lack of studies in this regard. Therefore, we conducted a cross-sectional study to evaluate the knowledge and attitudes of community members towards bleeding control in Jazan City using a self-reported online questionnaire during the period of April-May 2023.

1.2. Aims and Objective

The General Objective of the study is to evaluate the first aid knowledge and general awareness of bleeding control and their relations with different variables among Jazan City populations. The specific objectives include:

- Determine the prevalence of first aid training towards bleeding control among study participants.

- Evaluate the participants' knowledge about the basic domains of bleeding control and identify associated factors (e.g., gender, education, and age) with knowledge about bleeding control.

- Evaluate the participants' general awareness regarding bleeding control in case of road traffic injuries and their willingness to provide help.

1.3. Review of Literature

In the last decade, significant strides have been made in the management of uncontrolled hemorrhage to improve the survival rate of injury patients. In 2015, the Stop the Bleed Campaign was designed to educate and increase the knowledge of community members and the public about controlling bleeding before the arrival of emergency personnel [10]. The excessive mortality and morbidity associated with an injury that could be prevented leads to this shift in the improvement of community members' knowledge and skills regarding BC.

A recently published study reported that about 54.9% of all deaths were potentially preventable, road traffic accidents and control of external bleeding contributed to predicting preventable trauma-related mortality [11]. Another previous study conducted in Türkiye showed that the chances of death increased from 35% in the first 5 minutes to 54% in 30 minutes following an accident injury. Uncontrolled bleeding was one of the main factors leading to death or disability, yet it can often be controlled through simple and timely first-aid interventions [12]. Adequate knowledge of first aid among bystanders can alter the possibility from death to life, from prolonged hospitalization to a rapid recovery, and from permanent to temporary or no disability.

According to the American Heart Association and American Red Cross Guidelines for First Aid, direct pressure is the best way to control bleeding [13]. The amount of pressure applied and the duration of the pressure are the most important factors affecting successful bleeding control. The pressure must be firm, and it must be maintained for a long time until the bleeding stops or the arrival of emergency professionals [14]. This can be done either by manual pressure using gauze or other cloth placed over the bleeding source. If bleeding continues, additional gauze and applying more pressure may be necessary.

Tourniquets have been shown to control bleeding effectively when used by paramedics in a civilian setting [15]. A study conducted in Iraq found that prehospital tourniquet use was associated with improved hemorrhage control and reported that 57% of the deaths might have been prevented by earlier tourniquet use [16]. However, potential dangers of prolonged tourniquet application include temporary or permanent injury to the underlying nerves and muscles, and systemic complications. These complications are related to tourniquet pressure and duration of occlusion. Therefore, they should only be used with proper knowledge and training. If a tourniquet is used, make sure that you note the time it was applied and communicate that time to EMS personnel [17].

McCarty *et al.* (2019) showed that participants lacking prior bleeding control training had a 2.12 times higher odds of correct tourniquet application, while those with FA + BC had 3.50 higher odds of correct application. Furthermore, participants with prior bleeding control training were more willing to assist and were more comfortable performing hemorrhage control than those without prior training ($p < 0.05$) [18].

Nitin and colleagues in their study from Hyderabad, India uncovered that 80% of respondents lacked prior training in bleeding control, despite 84% expressing willingness to undergo training and assist bleeding victims. Notably, all teachers acknowledged the importance of integrating Stop the Bleed training into high school curricula, with 70.6% advocating for its inclusion starting from middle school. Moreover, the study highlighted a promising multiplier effect, where each trained participant could potentially educate 3 to 4 others at the household level, emphasizing the critical need for intervention and community empowerment in this domain [19].

Amr Arkoubi *et al.* found in their study of bystanders in Riyadh that a higher level of education and having previous first-aid training were significantly associated with better knowledge ($p = 0.001$ and 0.012, respectively) [20].

Yaser Sharifi *et al.* in their study from Iran concluded that the knowledge, attitude, and practice of EMS staff regarding bleeding control were moderate, positive and appropriate, and incomplete, respectively. Since bleeding is a life-threatening status and EMS staff skills are critical in this issue, continuous education in this regard is required [21].

Millicent Okereke conducted a study in the US, which concluded that providing the Stop The Bleed course to high school students from a community with high levels of violence led to heightened levels of comfort, readiness and willingness to act to control bleeding. If these opinions translate into action, students' willingness to act could potentially mitigate pre-hospital blood loss and equip youth with the capability to perform life-saving interventions [22].

2. Materials & Methods

2.1. Study Design

A cross-sectional study was conducted in Jazan City, a mixed urban-rural area

covering 40,000 Km^2, Saudi Arabia between April 2023 to May 2023. Data was collected using a self-reported online survey questionnaire distributed via email and social media apps. A total of 250 responses were included in the study.

2.2. Study Participants and Sample Size

Participants were self-enrolled, meeting the inclusion criteria of being > 13 years old, living in Jazan City, and having the ability to answer all questionnaire questions. Individuals who declined to provide consent, were younger than 13 years old, or were not residents of Jazan City were excluded.

Sample size was calculated using an online sample size calculator with a 95% confidence level and a margin of error within ±5% of the measured/surveyed value. The proportion of adults aged above 13 years was unknown, thus an assumed probability of p = 0.5, target sample size was set at 384. Simple random sampling was employed to enroll the required number of individuals.

2.3. Data Collection[1]

The data collection process lasted one month, April 2023. Study tool was an online anonymous self-report questionnaire that consisting of three parts with closed-ended questions, this questionnaire was validated and adopted from previous studies conducted in Saudi Arabia and other countries.

- **The first part** collected general characteristics of participants (sociodemographic information) including six questions about age, gender, nationality, education level, occupation, and residence. Additionally, participants were asked about previous bleeding control first aid training (BCFAT).

- **The second part** contained five questions designed to assess the participants' general awareness and attitude toward bleeding control first aid. It also included some questions to evaluate participants' willingness to intervene in a bleeding emergency, their comfort level in that situation, and reasons for discomfort if applicable.

- **The third part** consisted of seven questions to assess participants' knowledge of bleeding control techniques.

2.4. Ethical Consideration

The ethical considerations for this research study were addressed and adhered to by obtaining approval from the Jazan University Scientific Research Committee. Informed consent was obtained from all participants, ensuring confidentiality and anonymity of their personal information. Participants were selected based on appropriate and non-discriminatory criteria, with measures taken to minimize potential harm or discomfort. The study underwent ethical oversight to ensure compliance with ethical principles and guidelines. By addressing these ethical considerations, the study was conducted in a manner that respected the rights and welfare of study participants and adhered to ethical standards. (Approval No-18, 03-04-2023)

[1]Survey Questionnaire is attached in **Appendix 1** at the end of the paper.

2.5. Data Management and Statistical Analysis

General awareness and attitude were classified as positive and negative based on responses to questions assessing the opinions on bleeding control. Four questions were asked, and each question has a score of 1 = proper/correct opinion or 0 (Appendix 2) if improper/incorrect. For the question regarding confidence level in emergency situations requiring bleeding control, responses ranged from very uncomfortable (scored as 0), to very comfortable (scored as 5). Then, the total score was and if it was *equal to or above* 5 *it was considered positive, otherwise negative*. **Evaluating participants' knowledge**, the corrected answer was represented as 1 score, while incorrect or "I don't know" responses were represented as 0. Then, summing up correct responses and categorize participants' knowledge of bleeding control into *good if score is* ≥ 5 *questions* correctly; otherwise, participants' knowledge was categorized *as poor, if they scored* < 5. **Statistical Analysis:** after completing the data collection process, data was entered and coded using Microsoft Office (MS) Excel 2022, with incomplete or incorrect responses checked and removed. SPSS version 26 was used for data analysis. Data about quantitative continuous variables were reported as mean ± SD, while qualitative categorical variables (e.g., gender and education) were recorded as percentages and frequencies. Chi-square test was used to find out the association of sociodemographic variables and prior BCFA training with the level of knowledge of bleeding control. All associations were considered significant at $P < 0.05$.

3. Results

3.1. Participants Sociodemographic Profile

The present study focused on evaluating the community knowledge about bleeding control and their relations with different variables among Jazan City population, Saudi Arabia. Of 250 participants who completed the questionnaire, most were aged between 16 - 25 years. 152 (60.8%) were males, and about 90% are Saudi citizens. 143 (57.4%) participants had a bachelor degree. Only 53 (21.2%) participated in previous first-aid training on bleeding control.

More than half of the participants were unemployed. A significant portion of participants, 197 (78.8%) did not participate in any previous first-aid training program (Figure 1). Detailed descriptive analysis of sociodemographic profile of study participants is shown in Table 1.

3.2. Bleeding Control General Awareness and Attitude

Participants were asked six questions to evaluate their general awareness and attitude. A significant portion (about 90%) of participants were aware of the fact that uncontrolled bleeding is a major cause of preventable death. Most participants (68.8%) also were aware of the trend of bleeding control courses, the major source of information was social media (65.1%), followed by healthcare-related posters in malls and healthcare facilities (23%) (Figure 2). Regarding torniquet use, more than two-thirds of participants believed it is safe (65%), about 24

(10%) believed it is unsafe, others 64 (25%) were unsure.

Only 42 participants were very comfortable when they were asked about their confidence level in regard to responding to medical emergencies that need bleeding control. In contrast, 82 were uncomfortable. Reasons for not being comfortable were shown in Figure 3 in which the major concerns were not adequately trained to help, fear of making a mistake during the process and fear of causing more harm because of inadequate training**.** Regarding willingness to help in such circumstances in real life, a significant portion of participants had shown a likely interest to help 16 (69%). Table 2 summarizes participants' responses about general awareness and attitude.

The overall mean score of attitudes among participants was 5.6 ± (1.6) SD. About 131 (52.4%) participants had a positive attitude in regard to BC first aid (Figure 4).

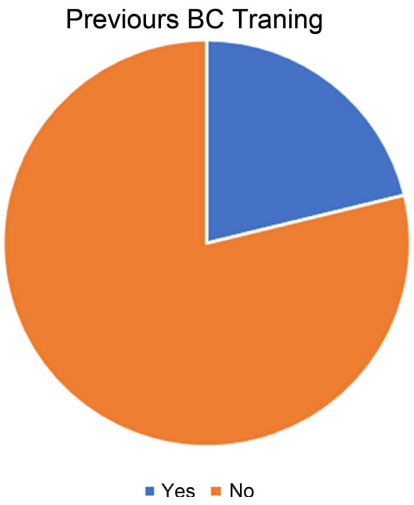

Figure 1. Previous experience in bleeding control training.

Table 1. Sociodemographic profile of study participants.

Variable		f	%
Age	≤15	8	3.20%
	16 - 25	170	68.00%
	25 - 60	69	27.60%
	≥60	3	1.20%
Gender	Male	152	60.80%
	Female	98	39.20%
Nationality	Saudi	224	89.60%
	Non-Saudi	26	10.40%
Education level	Middle school	6	2.40%
	High school	83	33.30%
	Bachelor	143	57.40%

Continued

Education level	Above Bachelor	13	5.20%
	No formal edu.	4	1.60%
Occupation	Healthcare worker	33	13.20%
	Not Healthcare worker	57	22.80%
	Unemployed	160	64.00%
Residence	Urban area	129	51.60%
	Rural area	121	48.40%
Previous First aid training	Yes	53	21.20%
	No	197	78.80%

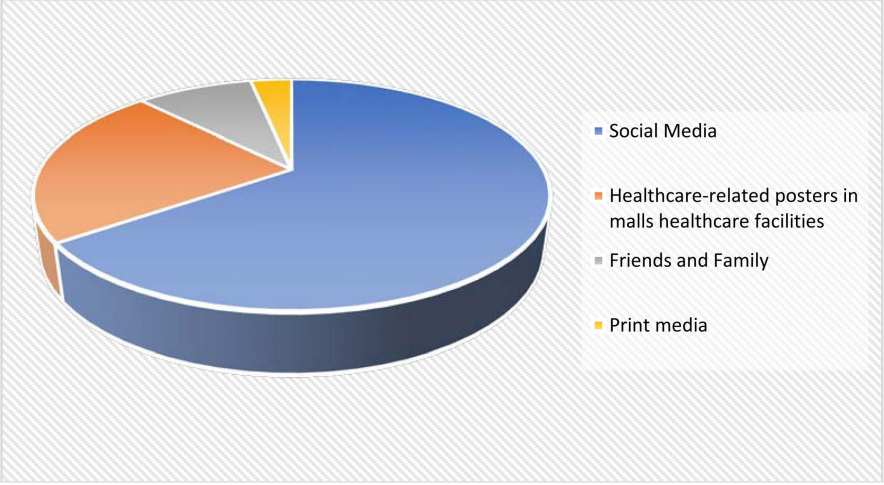

Figure 2. Source of Information about bleeding control programs.

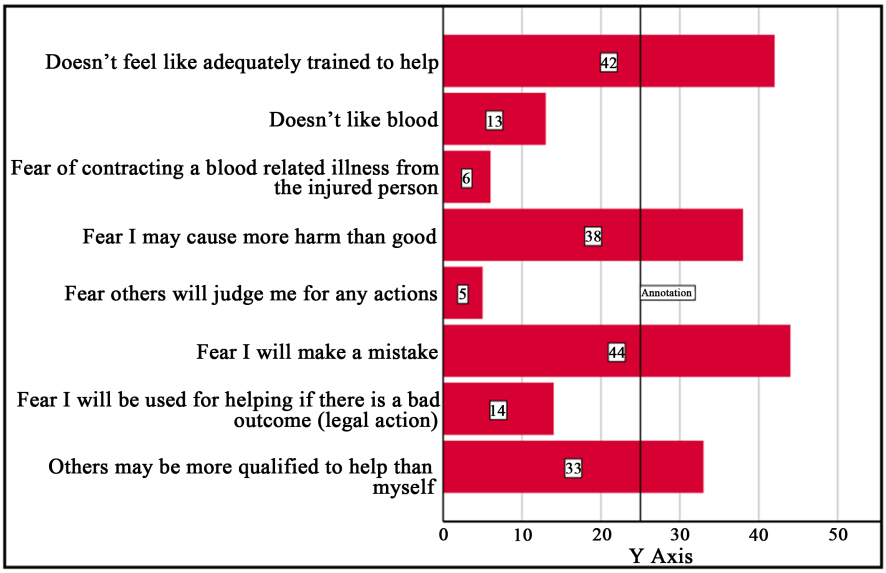

Figure 3. Reasons for not being comfortable helping in an emergency by applying a tourniquet to control bleeding.

Table 2. Participants' response about general awareness and attitude.

		Count	N%
Uncontrolled Bleeding is a major cause of preventable death	Yes	223	89.20%
	No	27	10.80%
Trend of Bleeding Control courses	Yes	172	68.80%
	No	78	31.20%
Source of Information	Social Media	123	65.10%
	Healthcare-related posters in malls healthcare facilities	43	22.80%
	Friends and Family	17	9.00%
	Print media	6	3.20%
In your opinion tourniquet use is?	Safe	162	64.80%
	Not safe	24	9.60%
	Not sure	64	25.60%
Would you use a tourniquet in real life?	Yes	171	68.40%
	No	79	31.60%
How would you rate your confidence level in regard to responding to medical emergencies?	Very uncomfortable	32	12.80%
	uncomfortable	82	32.80%
	Somewhat Comfortable	80	32.00%
	Comfortable	42	16.80%
	Very comfortable	14	5.60%
Are you willing to help the trauma victim with uncontrolled bleeding in real life?	Likely to help	167	66.80%
	Not sure to help	56	22.40%

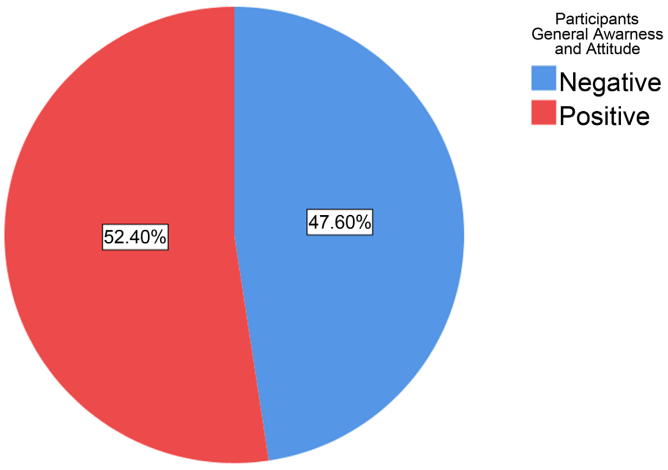

Figure 4. Participants' general awareness and attitude.

3.3. Bleeding Control Knowledge

When participants were asked about the first thing to do to control bleeding, the majority 145(58%) answered to find the source of bleeding. No participants answered to wipe away pooled blood. About the questions regarding life threatening bleeding, the majority considered all types of bleeding mentioned in the question to be an example of dangerous life-threatening bleeding (69.2%), followed by bleeding in which blood is spurting out of the wound (12.4%), blood that won't stop coming out of the wound (12%), bleeding in a victim who is now confused or unconscious (6%), bleeding in which blood is pooling on the ground (0.4%). Only 40 (16.0%) of participants stated that treating bleeding from a penetrating extremity wound without a trauma kit, you must first take a clean cloth and cover the wound, then try to stuff the cloth down into the wound. Regarding the questions about where to place a torniquet (to an arm or leg) to stop bleeding; 149(59.6%) participants responded that it should be placed at least 2 to 3 inches above the bleeding site. A significant portion 219 (87.6%) knows that after securing the tourniquet, time should always be noted. 87 (34.8%) participants did not know there is a relation between pain and tourniquet tightness. Table 3 shows the assessment of respondents' knowledge of bleeding control.

The overall mean of bleeding control knowledge was 2.31 ± (1.12) SD. Most participants 174 (69.6%), were found to have poor knowledge. While 76 (30.4%) of participants had good knowledge. (Figure 5)

3.4. Factors Associated with Bleeding Control Knowledge

The prevalence of poor knowledge among participants was 174 (69.6%). Of these, 99 (65.1%) were males and 76 (77.6%) were females. A Chi-square test shows no statistically significant association between knowledge and the demographic factors; age, gender, occupation, nationality, and education, at ($p > 0.05$). However, there was a significant association between previous bleeding control training and knowledge, (Chi square-test = 40.373, d.f = 1, $p = 0.00$) at $p > 0.05$. Participants with previous first-aid training in bleeding control were found to have more knowledge than participants without training (Figure 6). Table 4 shows and compares the characteristics of participants in relation to knowledge.

The participants' willingness to help victims that need bleeding control in real-life emergency situations was significantly associated with knowledge level (Chi-square test = 29.1, d.f = 2, $p = 0.000$). Participants with good knowledge were more likely to help than those with poor knowledge of BC (Table 5).

4. Discussion

This study explored the community knowledge and attitudes towards bleeding compared with other studies controlled among the population of Jazan City, Saudi Arabia. Our findings reveal a significant disparity in first aid preparedness and general awareness concerning traumatic bleeding control, which is crucial for reducing preventable deaths due to hemorrhage.

Table 3. Participants' answers to bleeding control knowledge questions.

		Count	Percent
The first step of bleeding control is to	Find the source of bleeding	145	58.00%
	Perform CPR	8	3.20%
	Apply pressure to the wound	97	38.80%
	Wipe away pooled blood	0	0.00%
Some examples of life-threatening bleeding include	All of the above.	173	69.20%
	Blood that won't stop coming out of the wound.	30	12.00%
	Blood that is pooling on the ground.	1	0.40%
	Bleeding in a victim who is now confused or unconscious	15	6.00%
	Blood that is spurting out of the wound.	31	12.40%
When treating life-threatening bleeding from penetrating arm or leg wounds with a trauma kit, open cloth and then	Pack the wound with bleeding control gauze, plain gauze, or clean cloth	133	53.20%
	Apply steady pressure with both hands directly on top of the wound	33	13.20%
	Push down as hard as you can	17	6.80%
	Continue to hold pressure until medical responders arrive	67	26.80%
When applying a tourniquet to an arm or leg, you should place it…	at least 2 to 3 inches above the bleeding site	149	59.60%
	as close to the wound as possible	46	18.40%
	where the patient says it is most comfortable	22	8.80%
	over the nearest joint	33	13.20%
When treating bleeding from a penetrating extremity wound without a trauma kit, you must first take a clean cloth and cover the wound, then…	Try to stuff the cloth down into the wound	40	16.00%
	Hold pressure until relieved by medical responders	123	49.20%
	Push down as hard as you can	11	4.40%
	Apply continuous pressure with both hands directly on top of the wound	76	30.40%
Once you've secured the windlass of the tourniquet to keep it tight, you should always note the time the tourniquet was applied	TRUE	219	87.60%
	FALSE	31	12.40%
If the victim is in pain, the tourniquet is on too tight	FALSE	87	34.80%
	TRUE	163	65.20%

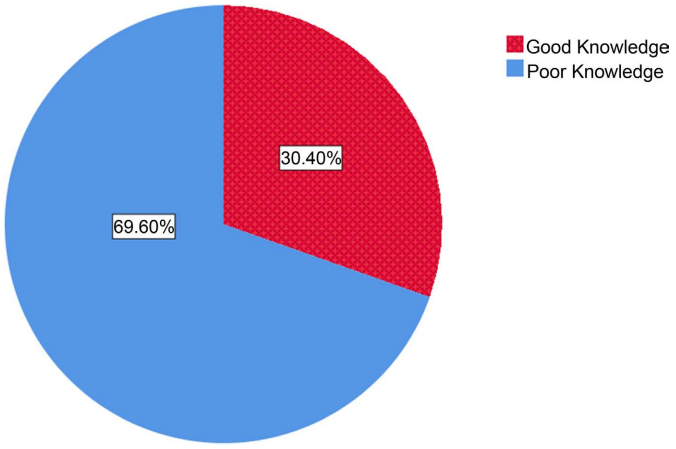

Figure 5. Prevalence of knowledge levels among study participants.

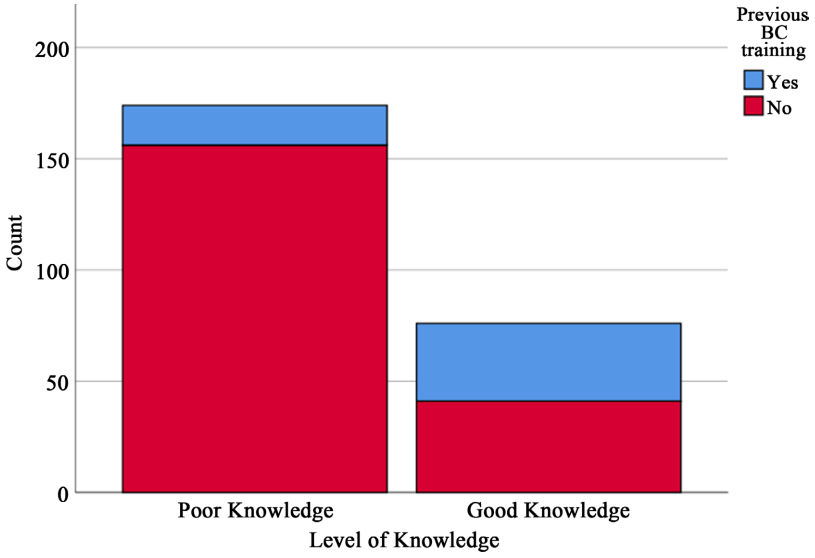

Figure 6. Prevalence of previous BC first aid training among different levels of knowledge.

Table 4. Factors related to knowledge level.

		Knowledge		p-value	Significance
		Good	Poor		
Age	<15	4 (50.00%)	4 (50.0%)	0.173	Not Significant
	16 - 25	55 (32.4%)	115 (67.6%)		
	26- <65	16 (23.2%)	53 (76.8%)		
	>65		3 (100%)		
Gender	Male	53 (34.9%)	99 (65.1%)	0.056	Not Significant
	Female	22 (22.4%)	76 (77.6%)		
Nationality	Saudi	63 (28.1%)	161 (71.9%)	0.058	Not Significant
	Not Saudi	12 (46.2%)	14 (53.80%)		

Continued

Education Level	Middle school	1 (16.7%)	5 (83.3%)	0.280	Not Significant
	Secondary school	23 (27.7%)	60 (72.3%)		
	Bachelor	49 (34.3%)	94 (65.7%)		
	Above	1 (7.70%)	12 (92.3%)		
	No formal education	1 (25.0%)	3 (75.0%)		
Occupation	Healthcare W	21 (63.6%)	12 (36.4)	0.06	Not Significant
	Non-Healthcare W	43 (75.4%)	14 (24.6%)		
	Unemployed	111 (69.4%)	49 (30.6%)		
Residence	Urban area	41 (31.8%)	88 (68.2%)	0.525	Not Significant
	Rural area	34 (28.1%)	87 (71.9%)		
Previous BC training	Yes	34 (64.2%)	19 (35.8%)	0.00	Significant
	No	41 (20.8%)	156 (79.2%)		

Table 5. Relation between participants' willingness and knowledge level.

		Level of Knowledge		p-Value	Significance
		Good	Poor		
Are you willing to help the trauma victim with uncontrolled bleeding in real life?	Likely to help	66 −41.50%	93 (58.5%)	0.000	Significant
	Not sure to help	8 −12.50%	56 −87.50%		
	Not Likely to help	1 3.70%	26 −96.30%		

A concerning 78.8% of the participants had never received formal first aid training, which includes crucial skills such as bleeding control. Furthermore, confidence levels in handling medical emergencies were notably low, with only 16.8% of respondents feeling comfortable responding to such situations.

There were several previous studies conducted on community knowledge and awareness regarding bleeding control and first aid education. A 2017 study in the United States found that only 25% of the participants had received any first aid education, and only 6% of them received education specifically related to bleeding control. In terms of knowledge about bleeding control, only 2% of the participants answered all the questions correctly, while 70% had inadequate

knowledge [23]. Similarly, a study conducted in Iran in 2019 surveyed 512 participants and found that only 22% of them had received formal first-aid training. When asked about their knowledge of bleeding control, only 9.4% of the participants answered all the questions correctly, while 50.2% had inadequate knowledge [24]. As in line with these previous studies, the results of the current study indicate a similar pattern of inadequate knowledge and lack of formal training in bleeding control. Nevertheless, the positive attitude towards bleeding control in emergency (52%) is a promising finding.

Another study conducted in the United States in 2017 found that only 6% of participants knew how to properly apply a tourniquet [25]. Compared to that, 59.6% in our study who correctly answered this question imply proper knowledge about applying a tourniquet. This suggests that the level of knowledge about bleeding control in Jazan, KSA is higher than in the United States, at least in terms of tourniquet application. Comparatively, a nationwide survey conducted in Norway presents a different scenario. The results indicate that a substantial 90% of respondents had received first aid training, with 54% having undergone such training within the preceding five years. The workplace emerged as the most common venue for receiving first aid training. Moreover, among the 43% of individuals who had encountered situations necessitating first aid, a high 89% reported having provided first aid during those instances [26].

In our study, 58.0% of participants correctly identified finding the source of bleeding as the first step, with 69.2% recognizing various types of bleeding as life-threatening. Additionally, 59.6% knew the proper placement of a tourniquet, and 30.4% demonstrated good overall knowledge. Previous bleeding control training significantly correlated with higher knowledge levels. Conversely, in the study by Amr Y. Arkoubi *et al*., 61.6% of participants opted for placing pressure on the wound as the primary first response, and 87.2% acknowledged the effectiveness of tourniquets. While only 40.2% exhibited adequate knowledge overall, those with higher education and previous first-aid training showed significantly better knowledge levels [20].

In Kuwait City, Al Sabah (2018) evaluated fifth-year medical students, finding that after training, participants demonstrated proficiency in dealing with unstoppable bleeding, placing a tourniquet, responding to epistaxis, and recognizing signs of internal bleeding [27]. Goralnick (2018) conducted a randomized controlled trial (RCT) among stadium employees in Massachusetts, USA, revealing that bleeding control training significantly improved correct tourniquet application (88% vs. 16% in the control group) with a 72% improvement and demonstrated retention of short-term knowledge [28].

Upon comparison with these studies, it appears that the prevalence of poor knowledge and limited first-aid training is a shared concern across different regions and populations. Furthermore, the significant association between previous bleeding control training and knowledge is consistent with the findings of previous studies, indicating the importance of providing first aid education and training to

the community. Additionally, the association between knowledge level and willingness to help in real-life emergency situations also emphasizes the need for promoting bleeding control education and training within the community.

In summary, the results of the current study align with the findings of previous studies on community knowledge and awareness regarding bleeding control and first aid education. The study highlights the need for increased first aid education and training, specifically related to bleeding control, in the community to improve knowledge and willingness to help in real-life emergency situations.

5. Conclusion

Based on the findings of our study, it can be concluded that there is a high prevalence of poor knowledge regarding bleeding control within the investigated community, with approximately 78.8% of participants displaying inadequate knowledge in this area. While a positive attitude towards bleeding control was observed in just over half (52%) of participants, there is still room for improvement. Interestingly, our study found that previous first-aid training was associated with a higher level of knowledge regarding bleeding control. This emphasizes the importance of targeted educational interventions, such as first aid training courses, to improve community knowledge and preparedness for emergencies. Overall, our findings underscore the need for increased education and training in bleeding control among the general population. By improving both knowledge and attitudes towards bleeding control, we can enhance community preparedness and potentially save lives in emergency situations. Future research may focus on evaluating the effectiveness of educational interventions in improving knowledge and attitudes toward bleeding control in the community.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix 1

Study Questionnaire

Community Knowledge about Bleeding Control in Jazan, KSA

Your participation in this study is voluntary.

I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind.

Research team guarantee that all provided information will be treated confidentially and used only in aim of this and not use in other purpose.

Bleeding after trauma (e.g., traffic accidents, falls, violence injuries, etc.) is the second leading cause of death in patients in the prehospital environment, and intervention by bystanders before the professional rescuers arrival could save victims lives.

CONSENT

I have read and understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost.

√ Agree

√ Disagree

***Sociodemographic characteristics*:**

1) Age:

2) Gender:

- Male
- Female

3) Nationality:

- Saudi
- Non-Saudi

4) Education level:

- Middle school
- High school
- Bachelor
- Master
- PHD
- Other

5) Occupation:

- Health care worker
- Non health care worker
- Unemployment

6) Residence:

- Urban aria
- Urban aria

General awareness and attitude toward bleeding control:

7) Did you share in any previous first aid training program?

- Yes
- No

8) Do you know that bleeding after accident is a major cause of preventable death?

- Yes
- No

9) Are you aware that around the world there is a trend of teaching common people some simple techniques of bleeding control at the accident scene?

- Yes
- No

If the answer is yes, what is the source of information

- Social media
- Print media
- Friends and family
- Healthcare-related posters in malls /healthcare facilities

10) In your opinion, the use of tourniquets is

- Not safe
- Safe
- Not sure

11) Would you use a tourniquet in real life?

- Yes
- No
- Not sure

12) How would you rate your confidence level in regard to responding to medical emergencies?

- Very uncomfortable
- Uncomfortable
- Somewhat comfortable
- Comfortable
- Very Comfortable

13) Reasons for not being comfortable helping in an emergency by applying a tourniquet to control bleeding:

- Others may be more qualified to help than myself
- Fear I will be used for helping if there is a bad outcome (legal action)
- Fear I will make a mistake
- Fear others will judge me for my actions
- Fear I may cause more harm than good
- Don't feel adequately trained to help
- Fear of contracting a blood related illness from the injured person
- Don't like blood

14) Are you willing to help the trauma victim with uncontrolled bleeding in real

life:

- Likely to help
- Not sure to help
- Not likely to help

Bleeding Knowledge:

15) The first step of bleeding control is to:

- Perform CPR
- Find the source of the bleeding
- Apply pressure to the wound
- Wipe away pooled blood

16) Some examples of life-threatening bleeding include…

- Blood that is spurting out of the wound.
- Blood that won't stop coming out of the wound.
- Blood that is pooling on the ground.
- Bleeding in a victim who is now confused or unconscious.
- All of the above.

17) When treating life-threatening bleeding from penetrating arm or leg wounds w/a trauma kit, open clothing over the wound, wipe away pooled blood, then

- Push down as hard as you can
- Apply steady pressure with both hands directly on top of the wound
- Pack the wound with bleeding control gauze, plain gauze, or clean cloth
- Continue to hold pressure until medical responders arrive

18) When applying a tourniquet to an arm or leg, you should place it…

- over the nearest joint
- as close to the wound as possible
- where the patient says is most comfortable
- at least 2 to 3 inches above the bleeding site

19) When treating bleeding from a penetrating extremity wound without a trauma kit, you must first take a clean cloth and cover the wound, then…

- Apply continuous pressure with both hands directly on top of the wound
- Hold pressure until relived by medical responders
- Push down as hard as you can
- Try to stuff the cloth down into the wound

20) Once you've secured the windlass of the tourniquet to keep it tight, you should always note the time the tourniquet was applied.

- True
- False

21) If the victim is in pain, the tourniquet is on too tight:

- True
- False

Appendix 2

Confidence level in emergency situations requiring bleeding control						
Confidence	Not at all comfortable	Very Uncomfortable	Uncomfortable	Neither Uncomfortable nor comfortable	Comfortable	Very comfortable
Score	0	1	2	3	4	5