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21 September University of Medical & Applied Sciences
General Surgery Department

الجمهورية اليمنية
وزارة التعليم العالي والبحث العلمي
جامعة ٢١ سبتمبر للعلوم الطبية والتطبيقية
كلية الطب والعلوم الصحية
قسم الجراحة العامة

Knowledge and Practice Related to Burns and Their First Aid among Medical Students in 21UMAS, Sana'a City, Yemen

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المعرفة والممارسة المتعلقة بالحروق والإسعافات الأولية بين طلاب الطب في جامعة ٢١ سبتمبر للعلوم الطبية و التطبيقية, صنعاء, اليمن

RESEARCH TEAM

Shima Mohammad Al-Sumairi
Ahlam Abdo Al-Raeai
Ahmed Mohammed Al-Mehdar
Ahmed Abdo Al-Qowati
Ahmed Mohammed Al-Qasem
Ahmed Amin Hezam

Khleel Adel Al-Edresi
Ra'ed Faisal Gabal
Amani Aref Al-Awadhy
Jareer Mahmood Babakr
Mohammed Asmail Al- Qasmi
Fatima Khalid Saeed
Ibrahim Ali Ghushaim

Supervisors:

Dr. Moamer Badi

PhD community medicine

Dr. Basheer Othman

Consultant of Plastic and reconstruction surgery

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The Researchers

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List Of Abbreviations

21UMAS (21 September University of Medical & Applied Sciences)

ABC (airway, breathing, circulation)

American Burn Association (ABA)

Burn-related injuries (BRIs)

Republic of Yemen (REF).

analysis of variance (ANOVA)

lecture-based learning (LBL)

problem-based learning (PBL)

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Abstract:

Background: Burns are injuries caused by heat, chemicals, electricity, or radiation thus damaging the skin and underlying tissues. Burns can cause pain, redness, swelling, blisters, and scarring. The severity of a burn is determined by its depth and size. A first-aid treatment for burns includes cooling the affected area by running cold water over it for 10-20 minutes, covering the burn with a clean and dry cloth, and seeking medical attention for severe burns.

Objectives: Our study aimed to delineate the level of knowledge and awareness of burn and its first aid management among undergraduate medical college students at 21UMAS.

Methods: This cross-sectional study was conducted between April 2011 and June 2012 and included all students at the Faculty of Medicine at 21UMAS in Sana'a, Yemen. A systematic random sampling procedure was used. Data were collected through a validated self-administered questionnaire. The questionnaire included 26 questions testing knowledge of burns, their degree, and their first aid. Descriptive statistics were computed using percentage, mean, standard deviation and frequency distribution were used to summarize the data. One-way ANOVA test was used to test the associations between the knowledge of respondents about burns and their first aid and the participant's characteristics.

Results: The participants (n = 348) were most frequently between 22 to 24 years (59.2%). The study found that, on average, the medical students at 21 September University possess an acceptable level of knowledge, with a mean score of 10.87 and a standard deviation of 3.12, representing a relative weight of 60.38%. Specifically, 21.8% of participating students obtained an excellent level of knowledge, 56.3% had a moderate level, 19% had a poor level, and 2.9% had a very poor level of knowledge regarding first aid for burns. The study also found that the primary source of information for students was the college, followed by social media, and then other sources such as schools, courses, and other outlets. Furthermore, the results indicated a low level of participation by students in community education regarding burn first aid management techniques. The study identified statistically significant variations in knowledge level regarding first aid for burns, with a significance level of 0.05, attributed to gender and favoring female students. Additionally, statistically significant variations in knowledge level regarding first aid for burns were observed for age group, with a significance level of 0.05, favoring female students in the older age group (over 24 years old), and for academic level, with a significance level of 0.05, and favoring students in the fifth academic level.

Conclusion: These findings underscore the continuing need for more education through programs aimed at raising the essential knowledge for medical students to diagnose and treat burn injuries.

Keywords: burns; a cross-sectional study; first aid management of burns, knowledge,21UMAS, Sana'a, Yemen.

[DB1] تعليق عليه: بدلا عن كلمه
Our
يتم استبدالها ب
This

[DB2] تعليق عليه: The participants (n = 348) were most frequently
يمكن استبدال هذه الجمله
Total of 348 students were studied more than half of them 59.2% were in the age between 22-24 years

CHAPTER 1: INTRODUCTION

1.1 Background of the study

Burn-related injuries (BRIs) are said to take place when part or all of the layers of the skin are disrupted by hot liquids (scalds), by hot solids (contact burns), or by a flame (flame burns); moreover, injuries to the skin caused by radiation, electricity, or chemicals are also classified as burns [1]. Socio-environmental advancement and modernization have led to an increase in the number of accidents in our daily lives, with BRIs constituting the major portion of such events. Burns are counted among the most expensive traumatic injuries, due to the long periods of hospitalization and the high costs caused by the wound and scar treatment [2,3].

Most burns in children are scalds caused by kettles, pans, hot drinks, and bath water accidents. Among adolescent patients, the burns are usually caused by young males experimenting with matches and flammable liquids. Scalds are uncommon in adults but are less frequent than flame burns. Most electrical and chemical injuries occur in adults. Cold and radiation are very rare causes of burns in adults. (4) Burns are the fourth most prevalent form of trauma worldwide and are one of the most devastating traumatic conditions confronted in practice, affecting patients' physical and psychological states at all ages [5].

Injuries related to burns and fires account for more than 300,000 deaths annually throughout the world [6]. According to the American Burn Association (ABA), more than 450,000 individuals present to the emergency departments, clinics, or physicians' offices to receive treatment for a burn-related injury in the United States and Canada; both of which are high-income and developed countries [2]. In Germany, approximately 20,000 children and adults suffer annually a thermal injury of varying severity; the male-to-female ratio is about 3:1 [3]. Burns can be classified into many types according to the cause, depth, severity, and surface of the body area.

The depth of the burn largely determines the healing potentiality and the need for surgical grafting. In general considerations, the traditional classification of burns as a first, second, third, or fourth degree was replaced by a system reflecting the need for surgical intervention. Current designations of burn depth are superficial, superficial partial-thickness, deep partial-thickness, and full-thickness [7]. The term fourth degree is still used to describe the most severe burns, burns that extend beyond

the skin into the subcutaneous soft tissue and can involve underlying vessels, nerves, muscles, bones, and/or joints. Children under the age of 5 and adults over the age of 55 are also more susceptible to deeper burns because of thinner skin [8-9].
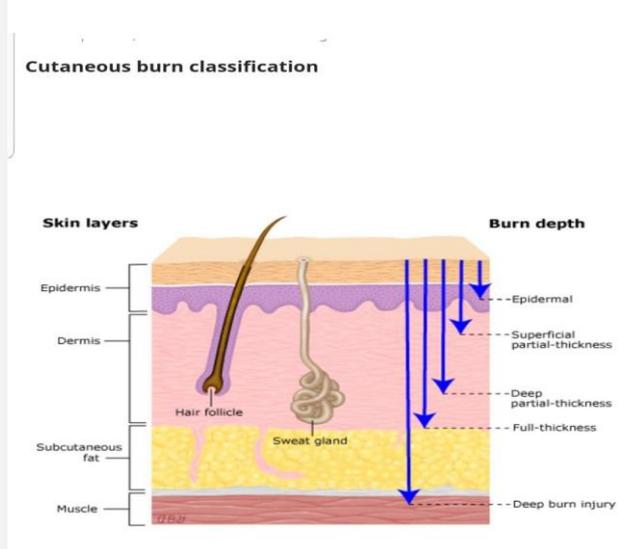
The American Burn Association (ABA) has published an educational resource that reviewed the classification and management of the burns wound. The classification system below is largely in agreement [10]: Superficial or epidermal burns involve only the epidermal layer of skin. They do not blister but are painful, dry, red, and blanch with pressure. Such injuries are generally healed in six days without scarring, This process is commonly seen with sunburns.

- Partial-thickness burns involve the epidermis and portions of the dermis. They are characterized as either superficial or deep:

Superficial partial thickness:

Figure 2: types of burns
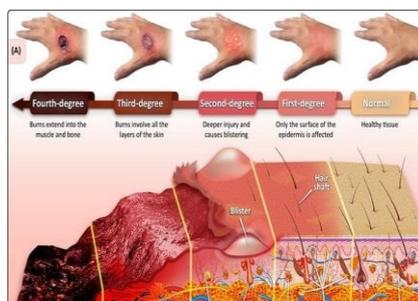
These burns characteristically form blisters within 24 hours between the epidermis and dermis. They are painful, red, weeping, and blanch with pressure, these burns generally heal in 7 to 21 days; scarring is unusual, although pigment changes may occur. A layer of fibrinous exudates and necrotic debris may accumulate on the surface, which may predispose the burn wound to heavy bacterial colonization and

Figure 3: classification of burns by depth of injury

Classification of burns by depth of injury

Depth	Appearance	Sensation	Healing time
Superficial (epidermal)	Dry, red Blanches with pressure	Painful	3 to 6 days
Superficial partial-thickness	Blisters Moist, red, weeping Blanches with pressure	Painful to temperature and air and touch	7 to 21 days
Deep partial-thickness	Blisters (easily unroofed) Wet or waxy dry Variable color (patchy to cheesy white to red) Blanching with pressure may be sluggish	Painful to pressure only	>21 days, usually requires surgical treatment
Full-thickness	Waxy white to leathery gray to charred and black Dry and inelastic No blanching with pressure	Deep pressure only	Rare, unless surgically treated
Deeper injury (ie, fourth degree)	Extends into fascia and/or muscle	Deep pressure	Never, unless surgically treated

Adapted from:
1. Mertens DM, Jenkins ME, Warden GD. Outpatient burn management. Nurs Clin North Am 1997; 32:343.
2. Peate WF. Outpatient management of burns. Am Fam Physician 1992; 45:1321.
3. Clayton MC, Solem LD. No ice, no butter. Advice on management of burns for primary care physicians. Postgrad Med 1995; 97:151.

Graphic 61540 Version 7.0
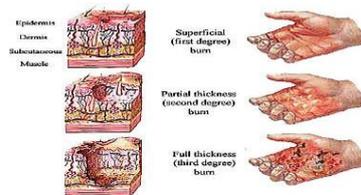
Figure 4: classification of burns according to degree

delayed healing. These burns typically heal without functional impairment or hypertrophic scarring.

Deep partial thickness: These burns extend into the deeper dermis and are characteristically different from superficial partial-thickness burns. Deep burns damage hair follicles and glandular tissue. They do not blanch with pressure. If an infection is prevented and wounds are allowed to heal spontaneously without grafting, they will heal in two to nine weeks.

These burns invariably cause hypertrophic scarring. If they involve a joint, joint dysfunction is expected even with aggressive physical therapy.

Full-thickness — These burns extend through and destroy all layers of the dermis and often injure the underlying subcutaneous tissue. Burn eschar, the dead and denatured dermis is usually intact. The eschar can compromise the viability of a limb or torso if circumferential. Extension to deep tissues. Fourth-degree burns are deep and potentially life-threatening injuries that extend through the skin into underlying soft tissue and can involve muscles and/or bones. The combination of the burn mechanism, depth, extent,

and anatomic location determine the overall severity of the burn injury, which provides general guidance for the preferred disposition and care of these patients. Minor or mild burn injury — Minor or mild burns are those that can be treated in a physician's office or an emergency department as an outpatient. Moderate burn injury — Moderate burns would be those that require admission to a hospital but not to a burn center. These include superficial burns or deeper burns of limited extent Severe burn injury — Severe burn injury can be defined as burns that should be referred to and treated at, a designated burn center.

Optimal management of burns always starts with first aid, as a first aid measure significantly influences burn outcomes, and decreases morbidity and healthcare costs [11] by reducing the severity of the injury and the degree of tissue damage [12,13].

First aid is a quick, temporary, and simple step with minimal or no medical equipment

that is done outside the hospital to save someone's life or at least relieve pain and

prevent the condition from worsening until the arrival of healthcare providers that

is the main aim of first aid [14-16].

 The future healthcare providers in the community are students at health science colleges.

First aid is not difficult, it needs a good attitude and a few simple steps with

adequate knowledge and skills that make anyone deal with any accidents [14].

There are many steps to do first aid in the burn, to save the patient's life which include (2):

1) **Ensure rescuer safety:** This is particularly important at house fires and in the case of electrical and chemical injuries.

2) **Stop the burning process:** Stop, drop and roll is a good method of extinguishing a fire burning a person.

3) **Check for other injuries:** A standard ABC (airway, breathing, circulation) check followed by a rapid secondary survey will ensure that no other significant injuries are

missed. Patients burned in explosions or even escaping from fires may have head or spine injuries and other life-threatening problems.

4) **Cool the burn wound:** This provides analgesia and slows the delayed microvascular damage that can occur after a burn injury. Cooling should occur for a minimum of 10 minutes and is effective up to 1 hour after the burn injury. It is a particularly important first aid step in partial-thickness burns, especially scalds. In temperate climates, cooling should be at about 15°C, and hypothermia must be avoided.

5) **Give oxygen:** Anyone involved in a fire in an enclosed space should receive oxygen, especially if there is an altered consciousness level.

6) **Elevate:** Sitting a patient up with a burned airway may prove life-saving in the event of a delay in transfer to hospital care. Elevation of burned limbs will reduce swelling and discomfort (10).

There is a common misconception in many areas such as the use of eggs, toothpaste, mud, and other traditional remedies that are harmful, certainly aggravating the injury and creating a more favorable environment for infection, and at best, these remedies are of no benefit.

The application of cool water can be successful if applied within 3 hours after the injury occurred [11,17].

Although the proper usage of neutralizing agents is very important in the treatment of chemical burns, these agents are not immediately available for prehospital first aid treatment [18].

Therefore, the abundant rinsing of the wound with water represents the gold standard for the treatment of chemical burns [19]. Several studies have found a lack of widespread knowledge of burns and their first aid among both general population members and professional healthcare providers [20].

At some point in the medical curriculum students are taught how to handle emergencies in a hospital emergency setting where drugs and other necessities are available.

But the adequate knowledge required for handling an emergency without a hospital setting at the site of the accident or emergency may not be sufficient.

We hypothesized that undergraduate students of 21UMAS do not have sufficient knowledge of burns and first aid, and very few will have any formal first aid training.

To the best of our knowledge, no published data in Yemen is available regarding the knowledge of burns first aid.

1.2 Problem statement

Burns are a significant health concern worldwide, including in Yemen, where there is a lack of awareness and resources for proper burn management. Medical students play a crucial role in providing adequate care for burn patients. However, limited knowledge about burns and their first aid among medical students could lead to delayed or inappropriate treatment, resulting in significant morbidity and mortality. Therefore, it is essential to assess the knowledge and skills of medical students concerning the assessment and management of burn injuries. The present study will help in identifying deficiencies in their training and curriculum and supporting the development of targeted educational interventions to improve knowledge, skills, and practical training related to burn injuries in.

1.3 Study Significance

The lack of adequate first aid knowledge and practice among medical students in Yemen poses a significant challenge to providing emergency care and saving lives in the country. Despite being trained in medical techniques and procedures, medical students in Yemen often lack the necessary skills and confidence to administer basic first aid in emergencies. This knowledge gap is especially concerning given the ongoing conflict and humanitarian crisis in Yemen, which has left millions of people vulnerable to injury and trauma. Thus, addressing the issue of inadequate first aid

education among medical students in Yemen is crucial to improving emergency care and minimizing the impact of the ongoing crisis on the population.

1.4 Objectives of the Study

1.4.1 General Objectives:

Our study aimed to delineate the level of knowledge and awareness of burn and its first aid management among undergraduate medical college students at 21UMAS.

1.4.2 Specific Objectives:

1. To determine the participants' level of knowledge about the classification and types of burns and familiarity with providing first aid to burn victims.
2. To determine the students' knowledge resources about classification and types of burns and familiarity with providing first aid to burn victims.
3. To determine the association between the demographic characteristics and the medical student's knowledge resources.
4. To determine the level of the student's involvement in raising the awareness of the society of first aid to burn victims .
5. To identify the community's knowledge about first aid for burns, from the students of 21st September point of view.
6. To determine the variations in the level of students' knowledge and practices related to burns and their first aid according to gender, educational level, and age.

CHAPTER 2: LITERATURE REVIEW

2.1 Burns First Aid Background

In recent years, there has been increasing attention to improving the knowledge and first aid skills of medical students in managing burn injuries. The research conducted in the past decade has explored various aspects of burn knowledge and first aid among medical students worldwide.

One study by Yilmaz and colleagues (2016) investigated the burn first aid knowledge among medical students in Turkey. The results revealed that the students had limited knowledge about correct first aid procedures for burn injuries, such as the appropriate temperature of water for cooling the wound and the elimination of clothing that is in contact with the burn. [21]

Another study conducted by Roka and colleagues (2019) in Nepal found that medical students had a better understanding of burn management when they had received prior training on the subject. In this study, two-thirds of the students had received prior training in burn management, leading to a higher level of knowledge and first aid skills. [22]

Furthermore, research has also been conducted on the effectiveness of various teaching methods to improve the burn knowledge of medical students. A study by Shokrollahi and colleagues (2012) found that simulation-based training was a more effective educational method than traditional lecture-based teaching in improving the skills and confidence of medical students. [23]

Another study by Alirezaei and colleagues (2019) compared the efficacy of problem-based learning (PBL) and lecture-based learning (LBL) methods in teaching burn management to medical students. The results revealed that students who received PBL training had better knowledge retention and practical skills when compared to those who received LBL training. [24]

In conclusion, the research conducted in the last decade highlights the importance of improving the burn knowledge and first aid skills of medical students to improve clinical outcomes for burn patients. Further research is required to investigate the most effective teaching methods to improve burn management skills among medical students worldwide.

2.2 Previous Studies

1. previous study in KKU

A Cross-sectional survey was done on KKU medical students to document their sociodemographic data, knowledge, attitudes, and practices of burn prevention and first aid, and their sources of information the results of this study show that a total of 273 students, from pre-clinical and clinical level were enrolled in the study. With an average of 9.3 correct responses, the median score of knowledge regarding burn prevention and first aid was 56.2%. About half of the respondents (50.9%) achieved a fair knowledge score i.e., between 50-75%. College curriculum emerged as the major source of information for burn prevention (34.06%) and first aid (25.27%). About 42 % of students suggested that inclusion in the college curriculum would be the best way to increase awareness. YouTube emerged as the most common extra-curricular learning method (67.7%). Students in clinical years of medical education demonstrated significantly higher knowledge than thousands in pre-clinical years (p=0.01, COR=1.82). Fire prevention practices were not widely in place; however, students revved a positive attitude towards the same.

In addition, that study concluded that the medical students have a fair knowledge of burn prevention and first aid and carry a positive attitude towards training. Incorporating social media for health awareness shows promise.[25]

2. Previous study in the United Kingdom

Another study was conducted in the **United Kingdom**, and it show that; of the 300 students invited to join the survey, 244 fully completed the process, representing an 81.3% response rate. In addition, over the respondents over one-third (35%) said they had not received any teaching on burns. Moreover, less than half (45%) said they had received formal teaching. Eighty-eight percent of students identified a burn that can be caused by a dry heat source; however, 17% of students failed to acknowledge that chemicals are a recognized cause of burns. Only 32% of respondents were confident with the management of burns. These results suggest that there is a lack of understanding of burns management, as well as a lack of confidence in treating burns among graduated doctors. There was also a self-identified lack of teaching at an undergraduate level. These concerning results could be improved by the integration of burns into the core medical curriculum. [25]

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3. A study in Saudi Arabia

A study about Knowledge, Attitudes, and Practice of Burns Prevention and First Aid among Medical Students of **King Khalid University** and this study results was total of 273 students, from preclinical and clinical levels were enrolled in the study. With an average of 9.3 correct responses, the median score of knowledge regarding burn prevention and first aid was 56.2 %. About half of the respondents (50.9%) achieved a fair knowledge score i.e., between 50-75%. College curriculum emerged as the major source of information for burn prevention (34.06%) and first aid (25.27%). About 42 % of students suggested that inclusion in the college curriculum would be the best way to increase awareness. YouTube emerged as the most common extra-curricular learning method (67.7%). Students in clinical years of medical education demonstrated significantly higher knowledge than those in pre-clinical years (p=0.01, COR=1.82). Fire prevention practices were not widely in place; however, students revealed a positive attitude towards the same. The study concluded that; Medical students have a fair knowledge of burn prevention and first aid and carry a positive attitude towards training. Incorporating social media for health awareness shows promise. [26]

4. Other study in Saudi Arabia

A cross-sectional study about medical students' perception of burns first aid management was done at **Qassim University, Buraydah, Saudi Arabia** and the results of this study show that; Average perception level of the medical students was 82.5%; however, 7.7% had a good awareness level. Significant associations between the participants' perception level of BFAM and female students = 002), the older age group (p < 0.001), and being in the clinical years (p = 0.001) were observed in this study. In addition, college curricula (83%) were the main source of information about BFAM among participants followed by the internet and social media (20%).and it was concluded by; The awareness level about BFAM was average among the majority of Qassim medical students. However, the application of simulation laboratories as modern educational tools has become an ethical imperative in hands with continuously updated formal first aid courses and workshops, to improve students' abilities, especially in clinical phases. [27]

5. A study in Syria

A cross-sectional study titled" Assessment of First-Aid Knowledge Among Medical Students in **Syria**" was conducted at the University of Aleppo and its results were: Statistical analysis indicated that Academic year and Academic specialization have a significant effect on the level of knowledge, whereas demographic background (gender, university, marital status, housing status, work status, financial condition), reading, hearing, or receiving training in first-aid have no effect on it, and the conclusion describe that The level of knowledge among Syrian medical students in providing first-aid care is somewhat limited. Therefore, first-aid courses should be made more accessible to these students, and their effectiveness should be ensured and maintained through frequent updates. Moreover, more attention should be placed on publicizing first-aid knowledge in a way that makes life-saving procedures attainable to anyone, anytime and anywhere. [28]

6. A study in Pakistan

Survey on Knowledge of First Aid Management of Burns Amongst Medical and Non-medical Students **in Karachi, Pakistan.** This survey results were medical students had a better knowledge score than their non-medical counterparts (5.8 ± 1.6 versus 3.6 ± 1.5, $P < 0.01$), however, overall knowledge of BFAT remained inadequate among participants. Students who received formal training scored a higher mean knowledge score than most students with no training ($P < 0.01$). and it concluded that "The majority of students had insufficient overall knowledge about BFAT, highlighting the need for integrating this topic into the curriculum. In addition, education of the masses via multimedia and conducting formal training courses are both imperative in raising awareness and reducing the occurrence of BRIs. [29]

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2.3 Hypothesis:

1- Is there a relationship between the level of students and the knowledge of the burn?

2- Is there a relationship between the college and the sources of the information?

3- Is there a relationship between the demographic characteristics and the medical student's knowledge resources?

4- Is there a relationship between the community knowledge about first aid for burns, and the students of 21st September?

5- Is there a relationship between the level of students' knowledge and practices related to burns and their first aid according to gender, educational level, and age?

6- Is there a relationship between the college and students' level of knowledge on raising public awareness about first aid for burns?

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CHAPTER 3: MATERNAL AND METHODS

3.1 Introduction

Chapter 3 contains methodological issues regarding the study setting, study design study area and duration, study population, sampling frame, study participants, inclusion and exclusion criteria, sampling technique, and study variables. Data collection instrument and technique, the statistical analysis used, the operational definition of study variables, and ethical considerations are also discussed in this chapter.

3.2 Study design

This cross-sectional study was conducted between December 2022 and March 2023 and included all medical students from the faculty of medicine at 21UMAS in Sana'a, Yemen.

3.3 Study setting

This study was conducted in Sana'a Capital City of Yemen between December 2022 and March 2023. The study was performed in Sana'a City, which is the capital city of Yemen. It is in the center of Yemen and situated at an altitude of 2300 meters and has a dry, mild climate with 200 mm of rainfall annually and minimum–maximum average monthly temperatures of 6–30 °C. The area of the capital is about (5.6) square kilometers spread over ten districts, according to the administrative division authority of Sana'a City for the year 2004. Sana'a City has a population of 2,345,000 people. The population is growing 27 at a rate of (5.55%) per annum, with a population (of 8.9%) of the total population of the Republic of Yemen (REF).

3.4 Study population

Undergraduate students at 21UMAS in the faculty of medicine were included based on a belief that they possess less health information compared to the public. The study sample included 2659 students at 21UMAS in the faculty of medicine section, who

were available on the day of data collection, who agreed to participate in the study, and who returned filled questionnaires (Response rate=100.0%).

3.5 Inclusion and exclusion criteria

3.5.1 Inclusion criteria of cases:

All medical students of the faculty of medicine participants of 18 years of age or older, both sex and students were available during the data collection period of the study.

3.5.2 Exclusion Criteria of Cases:

- Students who were registered students in any of the other faculties at 21UMAS.
- Students who were attending other universities and who are not willing to participate in this study were excluded from the study.

3.6 Sample size determination

The sample size was estimated using Sloven's formula $n = N/(1+Ne^2)$. The sample size was calculated as in previous similar studies. We calculated our sample size based on the assumption that 50% of students have adequate knowledge about burns prevention and first aid.

At a 95% confidence interval and a margin of error of 5%, the target sample size was calculated as 348.

Respondents	Population size	sample size
1st Academic year	(348*2659) / 306	40
2nd Academic year	(348*2659) / 285	37

3rd Academic year	(348*2659) / 301	40
4th Academic year	(348*2659) / 704	92
5th Academic year	(348*2659) / 1063	139
Total number	2659	

Table 1: sample and population size

3.7 Sampling methods

The sample size was selected from the faculty of medicine from each level (1st to 5th), through a list obtained from the authority of the 21UMAS, stratified random sampling method was used to select eligible participants who were given a self-administered questionnaire.

3.8 Variables

Table 2: variables table

variables	operational definition	scales of measurement
Academic level	level of the current year in medical college	Years
pre-clinical	before 4th level in college	Years
post-clinical	4th and 5th levels	Years
burn course	attend any course in university, online, or any other place	Total number of courses

3.9 Techniques for data collection & pre-testing

A self-administered anonymous questionnaire was used for data collection. A questionnaire was designed based on previous studies [21,22,23]. It contained 26 questions in the following sections: questions related to the demographic and academic characteristics of the students including age group, sex, academic year level, and sources of information they learned.

The questionnaire, also, included 18 closed-ended questions about burn classification and first aid management with answer options as yes, No and I don't know to assess knowledge. Situation-based practice questions included multiple options with one correct answer. Questions to assess sources of information and identification of learning methods were constructed in a manner to provide multiple responses.

A grading method was used for each variable in this part as follows: 1 point was given to the correct option, 0 for the incorrect answer, and don't know (the total score was 18 points) used to calculate the percentage as very poor ($\leq 25\%$), poor (25-50%), fair (50-75%) and excellent ($\geq 75\%$).

Finally, the questionnaire contained three questions numbered (24,25, 26); the 24th measures the interest of the respondent toward acquiring more learning about First Aid of burn. The 25th question explores whether the students have done health education on burn First Aid. The last question ass the medical students on 21st September to evaluate the level of knowledge of the community about First Aid for the burn

3. the 10 Plan for data analysis & Interpretation

3.10.1 Statistical analysis:

Data were coded, entered, and analyzed using the Statistical Package for Social Science version 23. Qualitative data were expressed in the form of numbers and percentages (No and %). Quantitative data appeared as mean and standard deviations (Mean ± SD). Student-t test and analysis of variance (ANOVA) test were used to compare parametric data between two groups and more than two groups, respectively. Differences were considered significant at p-value < 0.05.

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3.10.2 Work Plan:

Table 3: time of work plan

months / activity	December	January	February	March	April
Introduction and objectives	🟥				
Methodology	🟪				
questionnaire writing		🟫			
Data collection		🟩			
Data analysis			🟨		
Review of data				⬛	

3.11 Ethical Considerations

Approval of study conduction was obtained from the ethical review Committee at the Faculty of Medicine 21UMAS. In addition, the purpose of the study was explained to all participants and confidentiality was assured, oral informed consent was obtained, and the survey tool was anonymous.

CHAPTER 4: RESULTS AND DATA ANALYSIS

The present study utilized systematic and logical techniques (SPSS version 24) to undertake data collection, results, and data analysis.

The table presented in the study displays the demographic and academic characteristics of the 348 medical students who participated in the study.

The study included 166 (47.7%) male and 182 (52.3%) female participants, with an overall response rate of 100.0%. Among the student participants, the majority (59.2%) fell within the age group of 22-24 years, followed by 23.3% of students aged 18-21 years. The lowest proportion of student participants (17.5%) were above the age of 24 years.

Table 4: Demographic and academic characteristics of studied medical students (N = 348)

Variable	demographic characteristics	Frequency	Percent (%)
Age	18-21	81	23.3%
	22-24	206	59.2%
	more than 24	61	17.5%
	Total	348	100.0%
Gender	Male	166	47.7%
	Female	182	52.3%
	Total	348	100.0%
your Academic year	1st year.	40	11.5%
	2nd year.	37	10.6%
	3rd year.	40	11.5%
	4th year.	92	26.5%
	5th year.	139	39.9%
	Total	348	100.0%

All study participants responded affirmatively when asked about their knowledge of first aid for burns, as demonstrated in Table 4:

Table 5: Medical students' response regarding their knowledge of burns.

Do you have any information about burns?		
	Frequency	**Percent**
yes	**348**	**100.0%**
No	**0**	**0%**
Total	**348**	**100.0%**
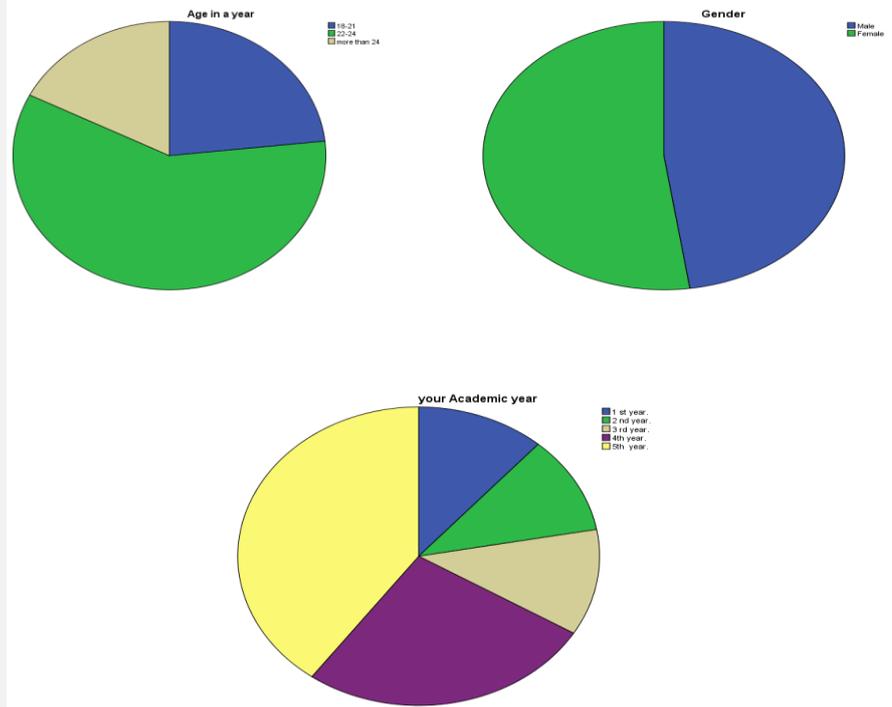
Figure 5: Students' variation according to gender, age, and academic level

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The following Table 6 illustrates the distribution of students' gender across academic levels:

Table 6: The following table illustrates the distribution of students' gender across academic levels.

Gender	Academic year	1st year.	2 nd year.	3 rd year.	4th year.	5th year.	Total
Male	Count	17	16	17	49	67	166
	% Within Gender	10.2%	9.6%	10.2%	29.5%	40.4%	100%
	% Within the Academic year	42.5%	43.2%	42.5%	53.3%	48.2%	47.7%
Female	Count	23	21	23	43	72	182
	% Within Gender	12.6%	11.5%	12.6%	23.6%	39.6%	100%
	% Within the Academic year	57.5%	56.8%	57.5%	46.7%	51.8%	52.3%
Total	Count	40	37	40	92	139	348
	% Within Gender	11.5%	10.6%	11.5%	26.4%	39.9%	100%
	% Within the Academic year	100%	100%	100%	100%	100%	100%

The previous table indicates that the majority of male students were from the fifth academic level, accounting for 40.4% of the total male sample, followed by the fourth level at 29.5%. The number of males in both the third and first levels was equal, accounting for 10.2% for each level, while the lowest percentage of male students was in the second level at 9.6%. Regarding female students across academic levels, the highest percentage of females was from the fifth academic level at 39.6% of the total female sample, followed by the fourth level at 23.6%. The percentage of female students was also equal in both the third and first levels, accounting for 12.6%

for each level, while the lowest percentage of females in the total sample was from the second academic level at 11.6%.

لا يفضل عرض الجداول مع الاشكال البيانيه [DB12]: تعليق عليه لنفس النتيجه لذا يتم عرض احداها وهنا ممكن الشكل البياني افضل للعرض

The distribution of the sample according to the gender-educational year variable
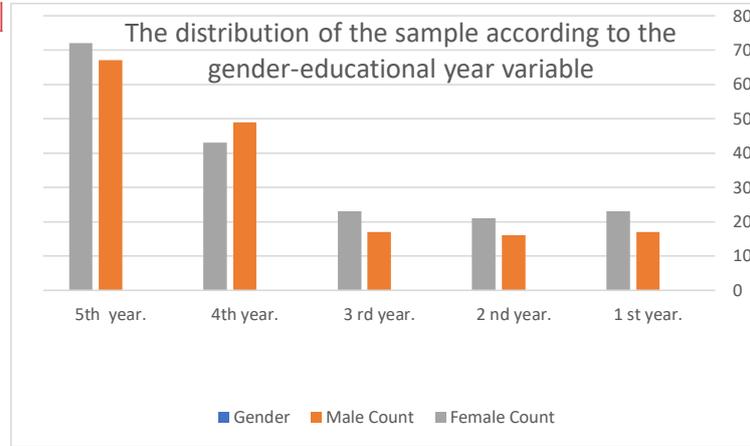
Figure 6: The distribution of the sample according to the gender-educational year variable

It is noteworthy that the percentage of females in each of the first, second, third, and fifth levels was higher than the percentage of males in each level, accounting for 57.5% in the first level, 56.8% in the second level, 57.5% in the third level, and 51.8% in the fourth level, respectively, from the total sample of males and females in each level separately. However, the percentage of males was higher than the percentage of females in the fourth academic level, accounting for 53.3% of the total sample for that level.

The distribution of the study sample according to the variables of gender and age is shown in Table (7).

Table 7: Gender * Age in a year Cross tabulation

Age / Gender		18-21	22-24	more than 24	Total
Male	Count	34	93	39	166
	% Within Gender	20.5%	56.0%	23.5%	100.0%
	% Within Age in a year	42.0%	45.1%	63.9%	47.7%

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Female	Count	47	113	22	182
	% Within Gender	25.8%	62.1%	12.1%	100.0%
	% Within Age in a year	58.0%	54.9%	36.1%	52.3%
Total	Count	81	206	61	348
	% Within Gender	23.3%	59.2%	17.5%	100.0%
	% Within Age in a year	100.0%	100.0%	100.0%	100.0%

 The previous table shows that the majority of males were between the ages of 22-24, comprising 56.0% of the total male sample. The lowest percentage of males fell within the age range of 18-21, at a rate of 20.5%. Similarly, the majority of females fell within the age range of 22-24, comprising 62.1% of the total female sample. The lowest percentage of females fell within the age range of over 24, at a rate of 12.1%.

It is also noteworthy that the percentage of females in both age groups (18-21 and 22-24) was higher than that of males, with rates of 58% and 54.9%, respectively, in comparison to the overall male sample for each age group. Additionally, most of the student sample over the age of 24 were males, comprising 63.9% of this age group.
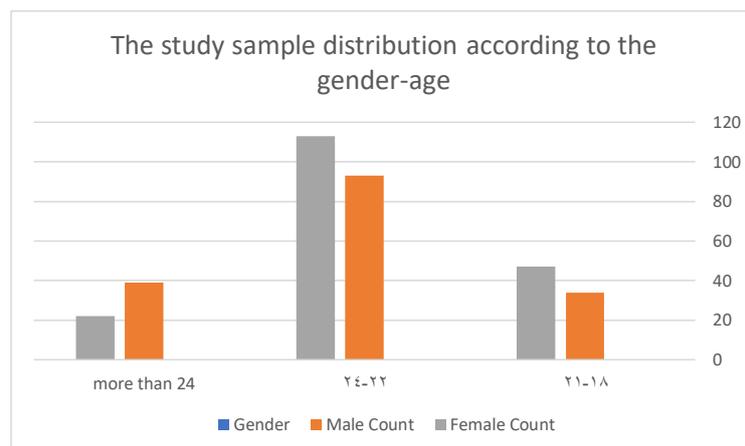
Figure 7: The study sample distribution according to the gender-age

As Table 8 demonstrates, the majority of students' sources of knowledge were their college with a percentage of 50.6%, followed by social media with 23%. Additionally, 8% of the students reported that their source of knowledge was the course, while 6.6% indicated that their source of information was the school. Finally, 11.8% of the students stated that their source of information was other sources.

Table 8: frequencies and percentages distribution of the student's source of information

Source of your information	Frequency	Percent
Your college.	176	50.6%
Social media.	80	23.0%
Course.	28	8.0%
School.	23	6.6%
Other sources.	41	11.8%
Total	348	100.0%

The following figure illustrates the responses of medical students regarding their source of knowledge about burns.
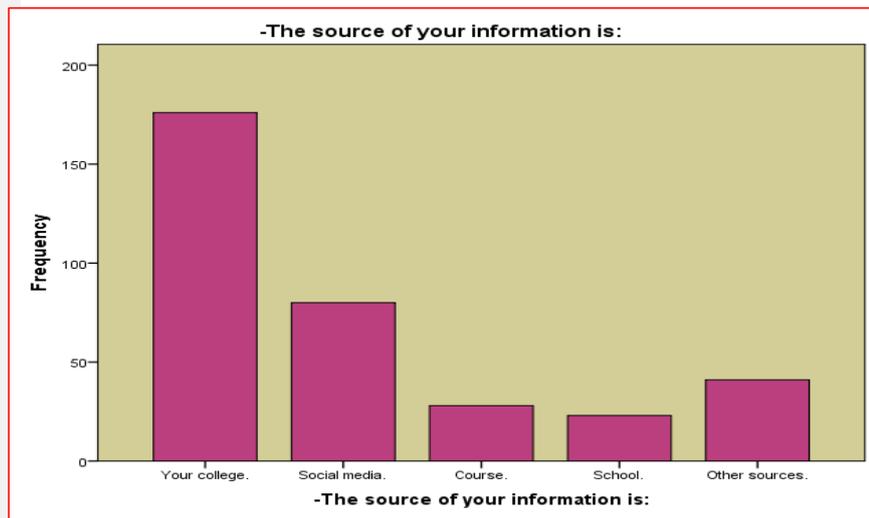
Figure 8: Source of student's information

To determine the significance of the relationship between the students' knowledge sources and their demographic characteristics, frequencies, percentages, and chi-square tests were extracted to identify the significance of these relationships as shown in the table:

Table 9: the relationship between the students' knowledge sources and their demographic characteristics using frequencies, percentages, and chi-square test.

Variable	demographic characteristics	Your college	Social media	Course	School	Other sources.	Chi-Square	p-value
Age	18-21	22	25	9	13	12	37.96	**0.00**
	22-24	110	47	15	10	24		
	more than 24	44	8	4	0	5		
Gender	Male	89	37	10	11	19	2.291	**0.682**
	Female	87	43	18	12	22		
Academic year	1st year.	11	10	7	6	6	110.9	**0.00**
	2nd year.	10	16	0	8	3		
	3rd year.	4	12	9	4	11		
	4th year.	49	27	3	4	9		
	5th year.	102	15	9	1	12		

From the previous table, it is evident that both the age and academic year of the student have an impact on the source of knowledge for the student. It is noticed that most of the students who chose the college as their source of information were aged between 22-24 and above 24, which is consistent with the majority of the students from higher academic levels in the fourth and fifth year of the college selecting it as a source of information on first aid for burns. This is evident from the level of significance is less than 0.01, which means that there is a statistically significant relationship between the age of the student and their source of knowledge about burns, as well as a relationship between the academic year of the student and their source of knowledge about burns. As for gender, it is observed from the previous

table that the significance level value is greater than 0.05, which means that there is no statistically significant relationship between the gender of the student and their response regarding their source of knowledge about burns.

4.1 The Level of Knowledge Related to Burns and First Aid Among Medical Students at 21 September University

Table 10: frequencies and percentages distributions of the students' correct answers related to the questions of Burns and First Aid knowledge.

Questions	Correct answer	N	(%)
Burn injuries may arise due to exposure with:	fire, Steam, Chemicals, radiation, and Electric.	314	90.2%
Types of burn injuries based on the degree of severity are	st,2nd, 3rd, 4th degree.	175	50.3%
Burns are classified as a minor burns if they involved:	Total body surface<10 %.	189	54.3%
A burn is classified as a major burn if it involved:	Total body surface >10 %.	242	69.5%
A burn is classified as a superficial burn if it affects …………. skin layer:	Epidermal.	269	77.3%
A burn is classified as a partial thickness burn if it affects:	Dermal and epidermal.	216	62.1%
A burn is classified as full thickness burn if it affects:	When penetrates the subcutaneous tissue under the skin.	243	69.8%
Children are the most vulnerable to exposure to burns:	True	304	87.4%
What should be the immediate first aid step for a burn injury?	Removing the person from the source of the burn.	272	78.2%
The recommended temperature for water to be used for burns wound	12°C-18°C.	62	17.8%

flushing:			
What is the recommended duration for a burn wound to be flushed with water?	10-minutes.	105	30.2%
What is the best burn first aid to be applied at the moment of injury?	Cool water.	215	61.8%
Is it necessary to keep the body warm?	Yes	214	61.5%
At which degree of burn should the patient visit a hospital	3rd degree.	259	74.4%
In case of burns, should you remove jewelry from the patient?	Yes	182	52.3%
Do you think home-based remedies shall be used as immediate first aid to relieve pain or burning?	No	93	26.7%
What should be done to prevent hypothermia in burn patients?	Covering with warm sheets or blankets.	208	59.8%
The proper arrangements of first aid steps are:	Stop the burn, take the patient away from the burn, and if small burn cool it with water.	221	63.5%
Would you be interested in learning more about the first aid of burns?	Yes	313	89.9%
Have you done health education for the community about burn first aid?	Yes	130	37.4%

The vast majority of students showed a great understanding of the causes of burns, with a high level of knowledge about the causes of burns at 90.2%. Only half of the study sample, or 50.3%, had an acceptable level of knowledge about the types of burns according to their degree of severity. Regarding the classification of burns into mild or severe based on the percentage of the total body surface area affected by the burns, 54.3% of students correctly classified mild burns, while most students had a good understanding of how to classify severe burns, with 69.5% of students correctly classifying them.

Similarly, regarding the classification of burns according to their degree of impact on the body, 77.3% correctly classified superficial burns, 62.1% of students correctly classified partial thickness burns, and 69.8% correctly classified full thickness burns, indicating that the majority of students had a good understanding of classifying burns as superficial, partial, or full thickness based on their impact on the body.

Most of the college students also knew that children are the most susceptible to burns, with 87.4% answering correctly about the age group most commonly affected by burns being children.

Furthermore, the majority of participants, 78.2% of medical students at September 21 University, knew that the immediate first aid step in dealing with burn injuries is to move the person away from the source of the burn. Only 17.8% knew the recommended temperature for water used in burns and wound washing, which is 12°C-18°C. Similarly, only 30.2% of students correctly knew the recommended time for using water to wash burns is 10 minutes, and only 61.8% had a good understanding of the best first aid for burns, which is to use cool water. Additionally, 61.5% correctly understood the need to maintain the patient's body warmth, while 74.4% of students understood the need to transfer the patient directly to the hospital when the burn is of the fourth degree. Only a small percentage of students, 26.7%, believed that oil or butter should be used to treat burns, while 52.3% correctly believed that the jewelry should be removed from the burned person.

The results indicate that only a small percentage (26.7%) of medical students believe that home remedies should not be used in immediate first-aid treatment for burn injuries. Additionally, 59.8% consider covering the burned patient with warm blankets or sheets to be a safe method for preventing hypothermia. Lastly, only 63.5% of medical students correctly identified the appropriate steps for administering first aid treatment, which include stopping the burn, moving the patient away from the source of heat, and cooling the burn with water if it is a minor burn.

To gauge the extent of interest exhibited by the study participants about their knowledge acquisition and involvement in promoting community health awareness about the first aid treatment of burns, a systematic extraction of frequencies and

percentages of the participants' responses was conducted. The results of this analysis are presented in the following table (11).

Table 11: Interest of students in promoting community health awareness.

Questions	Number of positive responses	Percentage of positive responses
Would you be interested in learning more about the first aid of burns?	313	89.9%
Have you done health education for the community about burn first aid?	130	37.4%

The previous table demonstrates that the majority of participating students in the study, 89.9%, expressed interest in acquiring further knowledge about first aid for burns. On the other hand, the remaining students from the medical college showed no interest in this matter. Regarding the extent to which medical college students engage in health education activities for the community of first aid, only 37.4% of the students reported participating in such activities, while most students did not engage in this regard.

Moreover, the students' opinions regarding the community's knowledge about first aid for burns were analyzed, as illustrated in the following table:

Table12: students' opinions regarding the community's knowledge of first aid

		Frequency	Percent
Valid	Poor knowledge.	136	39.1%
	Mild knowledge.	149	42.8%

Good knowledge.	**29**	**8.3%**	
I don't know.	**34**	**9.8%**	
Total	**348**	**100.0%**	

39.1% of students perceive the community's knowledge of first aid to be poor, while 42.8% perceive it to be average and 8.3% perceive it to be high. The remaining 9.8% of participating students did not express their knowledge on the matter.

To determine the level of knowledge of medical students at 21 September University, a score of one was assigned for each question answered correctly and 0 for incorrect or unknown responses. Thus, participants who answered 75% of the questions correctly (obtaining more than 13 out of 18) were considered to have an excellent level of knowledge of first aid for burns. If more than 50% but less than 75% of the questions were answered correctly (obtaining a score of more than 9 and less than or equal to 13), the participant was considered to have a fair level of knowledge. If the participant answered less than 50% and greater than 25% of the questions correctly (obtaining a score less than 9 and more than or equal to 5) the participant was considered to have poor knowledge. If the participant answered less than 25% (obtaining a score of less than 5), they were considered to have a very poor level of knowledge.

Table 13: prevalence of the level of knowledge among medical students relating burn First Aid

knowledge	Frequency	Percent (%)	Mean $\pm$ SD
Very poor (<25%)	**10**	**2.9%**	2.9 ± 1.6
Poor (50%-25%)	**66**	**19%**	6.88 ± 1.18
fair (50-75%)	**196**	**56.3%**	11.11 ± 1.35
excellent (≥75%)	**76**	**21.8%**	14.76 ± 0.85
Total			10.87 ± 3.12

From the previous table, we notice that the largest percentage of students, which reached more than half of the participants (56.3%), have a moderate (fair) level of knowledge about first aid for burns. While 21.8% of the participating students obtained an excellent level of knowledge, 19% obtained a poor level of knowledge,

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and 2.9% of the students obtained a very poor level of knowledge about first aid for burns. Through the overall average, we note that medical college students have a moderate level of knowledge with an overall average of 10.87 and a standard deviation of 3.12.

☒ **Are there significant variations in the level of knowledge of medical students at 21st September University regarding first aid for burns attributed to gender, age, and academic year**?

To identify these variations, arithmetic means and standard deviations were extracted for the knowledge axis regarding burn first aid for each independent variable. Then, an independent samples t-test was conducted to identify variations in knowledge level for gender variables and a one-way ANOVA test was conducted for independent groups consisting of more than two groups for age and academic year variables. Tables (14) and (15) illustrate the results.

Firstly, to identify variations in students' knowledge level regarding burn first aid information, an independent samples t-test was used, and arithmetic means and standard deviations were extracted. A Levine's test for homogeneity of variance was conducted, and the following table shows these results.

Table 14: means, standard deviations, Levine's Test for Equality of Variances, and t-te for knowledge variable.

Variable	Group Statistics			Levine's Test for Equality of Variances		t-test for Equality of Means		
Gender	N	Mean	Std. Deviation	F	Sig.	t	df	Sig. (2-tailed)
Male	166	10.10	3.15	2.359	0.126	-4.50	346	0.000

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Female	**182**	**11.57**	**2.93**

It is evident from the table that the mean scores of females are greater than those of males in the level of student knowledge regarding first aid for burns, indicating the presence of a significant variation between the means. To confirm the significance of these variations, we note that the level of significance in the t-test is less than 0.01, meaning that these differences are statistically significant, and thus females outperform males in the level of knowledge of first aid for burns.

Additionally, one-way ANOVA was used to identify variations in the level of knowledge of students regarding first aid for burns by gender, age, and academic year.

Secondly, variations in the level of knowledge of first aid for burns for all variables were extracted using one-way ANOVA. The means and standard deviations were computed for each age category of the knowledge variable regarding first aid for burns, followed by conducting a Levine's test for homogeneity of variances between the independent samples. The table below shows the results.

Table 15: Group Statistics Test of Homogeneity of Variances

Variable	knowledge	Group Statistics			Test of Homogeneity of Variances			
		N	Mean	Std. Deviation	Levine Statistic	df1	df2	Sig.
Academic year	1 st year.	40	9.3000	2.40938	1.380	4	343	0.241
	2 nd year.	37	10.6757	2.56097				
	3 rd year.	40	10.8000	2.88409				
	4th year.	92	10.0761	3.18732				
	5th year.	139	11.9209	3.13018				
	Total	348	10.8707	3.11877				

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Age	**18-21**	81	10.2222	2.56418	2.161	2	345	0.117
	22-24	206	10.8495	3.18406				
	more than 24	61	11.8033	3.37550				
	Total	348	10.8707	3.11877				
Gender	**Male**	166	10.1024	3.14812	2.359	1	346	0.126
	Female	182	11.5714	2.92878				
	Total	348	10.8707	3.11877				

Through the previous table, it can be observed that there are significant variations among the means of the medical college students for each study variable (gender, age, and academic year). The knowledge mean of fourth-year students is higher than the lower levels, and the means of second, third, and fourth-year students are higher than the mean of first-year students. Furthermore, regarding the age variable, there are significant differences between the mean grades of students above 24 years old and the mean grades of students of other ages, indicating that students outperform older individuals. In addition, regarding the gender variable, it is evident that the female mean is greater than the male means in their knowledge of first aid for burns. To confirm the statistical significance of these variations at the significance levels of 0.05 and 0.01, the homogeneity of variance for each sample in the three aforementioned variables was verified using Levine's test. The table shows that the significance level is greater than 0.05, which means that the variance is homogeneous for all samples. Therefore, a one-way ANOVA test can be conducted to identify the significance of these variations. The following table illustrates this:

Table 16: ANOVA Test

ANOVA						
Variable	**Knowledge**	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
your Academic	**Between Groups**	311.676	4	77.919	8.724	0.000

Age	**Within Groups**	**3063.505**	**343**	**8.932**		
	Total	**3375.181**	**347**			
	Between Groups	**87.207**	**2**	**43.603**	**4.575**	**.011**
	Within Groups	**3287.974**	**345**	**9.530**		
	Total	**3375.181**	**347**			
Gender	**Between Groups**	**187.351**	**1**	**187.351**	**20.335**	**0.000**
	Within Groups	**3187.830**	**346**	**9.213**		
	Total	**3375.181**	**347**			

From the previous table, it is evident that the significance level is less than 0.05, indicating the presence of significant variations in the mean scores of participants' knowledge about first aid for burns across all variables (gender, age, academic level). As for the gender variable, since the independent variable consists of only two groups, the direction of the variations can be determined directly, as in the independent samples t-test, yielding the same result: indicating statistically significant differences at a significance level of 0.01 between the mean scores of male and female students in the knowledge axis of first aid for burns, in favor of females with a higher average.

As for the independent variables consisting of three or more groups, we will resort to subsequent tests to determine the direction of the variations. We used the Tukey test due to the equal variance between groups, and the table shows the results of the Tukey test.

Table 17: post Hoc for the age variable

Multiple Comparisons
Dependent Variable: sum6_23
Tukey HSD

Age	age	Mean Difference (I-J)	Std. Error	Sig.
18-21	22-24	-.62729-	.40487	.269
	more than 24	-1.58106-*	.52335	.008
22-24	18-21	.62729	.40487	.269
	more than 24	-.95376-	.45000	.087
more than 24	18-21	1.58106*	.52335	.008
	22-24	.95376	.45000	.087

The table indicates the superiority of students aged over 24 years old over those in the age range of 18-21 years old, as the level of significance is 0.008, which is less than 0.01. This means that the older age group has a higher level of knowledge about first aid for burns. However, there were no statistically significant variations among the other age groups, as the level of significance was greater than 0.05.

Table 18: post hoc for educational year

Multiple Comparisons				
Dependent Variable: sum6_23				
Tukey HSD				
(I) Q_3	(J) Q_3	Mean Difference (I-J)	Std. Error	Sig.
1 st year.	2nd year.	-1.37568-	.68167	.259
	5th year.	-2.62086-*	.53623	.000
4th year.	1st year.	.77609	.56601	.647
	5th year.	-1.84478-*	.40167	.000
5th year.	1st year.	2.62086*	.53623	.000
	4th year.	1.84478*	.40167	.000

Through the previous table, it becomes clear that the variations were between the first-year students and fifth-year students, as well as between fourth-year students

and fifth-year students. This indicates the superiority of fifth-year students over both fourth year and first-year students, as the significance was statistically meaningful. This means that there were differences between the mean scores of fifth-year students and the mean scores of fourth-year students, in favor of fifth-year students with the highest average. Additionally, there were statistically significant differences between the mean scores of fifth-year students and the mean scores of first-year students, in favor of the fifth-year students with the highest average. However, there were no significant differences between the other levels.

☒ **The effect of the university student's level of knowledge on raising public awareness about first aid for burns.**

لا يمكن قياس التأثير الا اذا عملنا دراسه في [DB13]: **تعليق عليه** أوساط المجتمع وعملنا تدخل بالتثقيف ونقيس قبل وبعد لا اعتقد هذا تم ولم نقيس أي تأثير تم قياس فقط هل تم إعطاء تثقيف او لا كذلك تم قياس رؤية الطلاب عن مستوى وعي المجتمع وهذا مختلف تماما

Table 19: Effect of the university student's level of knowledge on raising public awareness about first aid for burns.

Variable	response	yes	No	Chi-Square	p-value
knowledge	Very poor (<25%)	5	5	3.724	0.293
	Poor (50%-25%)	30	36		
	fair (50-75%)	71	125		
	excellent (≥75%)	24	52		
	Total	130	218		

The table above shows that the level of significance is greater than 0.05, which means there is no significant correlation between the level of knowledge about first aid for burns and the degree of student participation in public education about first aid for burns.

CHAPTER 5: Discussion

5.1 Brief Overview of Research

Based on the study results, the medical students at 21 September University College of Medicine showed a moderate knowledge of first aid related to burns. The biggest correct perception of the students about the causes of burns was 90.2%, followed by their excellent knowledge of identifying the most susceptible people to burns, which are children, where 87.4% answered correctly. Additionally, most of the participants, reaching 78.2% of the medical students at 21 September University, knew that the immediate first aid step in dealing with burns injuries is to remove the person from the source of the burn. Also, concerning the classification of burns according to the degree of their impact on the body, 77.3% correctly classified superficial burns.

Medical students showed a moderate knowledge in percentages ranging from (74.4%-50.3%) and ranked from highest to lowest as follows: transferring the patient to the hospital immediately when the burn is fourth-degree, classifying large burns, appropriate arrangements for first aid steps, classifying burns as partial correctly, classifying total burns correctly, which shows that most of the students have a good understanding of classifying burns as superficial, partial, or total according to their impact on the body. Good knowledge of the best first aid for burns to be applied at the moment of injury is to use cold water, correct knowledge about the necessity of keeping the patient's body warm, covering the patient with warm blankets or sheets is a safe way to prevent a decrease in body temperature, removing jewelry from the burn victim, classifying burns as mild or severe according to the percentage of the total body surface area affected by burns, students correctly classified mild burns, acceptable knowledge about the types of burns according to their degree of severity.

As for the weak knowledge, the recommended time for using water to wash burns wounds, which is 10 minutes, was only recognized correctly by 30.2% of the students, and only a small percentage of 26.7% of medical students believe that home remedies should not be used in immediate first aid for burn injuries.

The study found that a large proportion of the participants had a low level of knowledge. Only 17.8% were aware of the recommended temperature for water used in treating burns and washing wounds, which is 12°C-18°C. These results were

consistent with a study conducted by Al-Batanony (2021) on medical students in the Qassim region of Saudi Arabia.

The study also found that medical students at 21 September University had an acceptable level of knowledge, with an average score of 10.87 and a standard deviation of 3.12. This means that 60.38% of the students had an average level of knowledge, while 21.8% had excellent knowledge, 56.3% had moderate knowledge, 19% had poor knowledge, and 2.9% had very poor knowledge of first aid for burns. These results differed from those of Al-Batanony (2021), which found varying levels of awareness among medical students in Qassim.

The study also revealed that older students and female students had better knowledge of first aid for burns than younger students and male students. These findings were consistent with other studies, such as Al-Batanony (2021) and Siddiqui (2018).

Furthermore, the study found that students in higher academic years had better knowledge than those in lower years, likely due to receiving more information from the university and other sources. The study also found that the most common sources of information for students were university curricula and social media, which has become an increasingly popular source of information among medical students around the world.

Finally, the study identified a weakness in the student's ability to educate the community about first aid for burns. This may be due to a lack of opportunities for students to gain practical experience in this area.

5.2 Limitations of the Study

The present research is a cross-sectional study, done on medical students at 21UMAS University at the faculty of medicine which is one of the most eminent governmental universities in the capital city of Yemen as a result it does not represent the Yemeni youth population. Also, the results of the current study do not represent the entire population of Yemen university students all over Yemen.

CHAPTER 6: CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Although the study results showed an average level of knowledge among medical college students regarding first aid for burns, there is a significant percentage of students with weak and very weak levels of this knowledge. This requires a reconsideration of the training programs and courses that help to develop and educate these participants, as well as the development of specialized curricula for first aid. Furthermore, further studies should be conducted to identify the obstacles that prevent students from possessing sufficient knowledge about first aid for burns and to encourage students to actively participate in educating the community on the importance of knowing and practicing first aid courses for burns.

6.2 Recommendations

Based on the current study and its result, here are some recommendations for improving first-aid knowledge and practice among medical students in general:

I.   Incorporate first aid training in the medical curriculum: Medical schools should consider including first aid training as a mandatory part of the curriculum. This can help ensure that medical students have a solid foundation of first-aid knowledge and skills that they can apply in various clinical settings.

II.   Provide hands-on training: One of the most effective ways to learn first aid is through hands-on training. Medical schools should provide

opportunities for students to practice their skills in simulated clinical scenarios, under the guidance and supervision of experienced trainers.

III. Emphasize the importance of first aid in clinical practice: Medical students should understand the critical role that first aid plays in clinical practice, and how it can help save lives and prevent complications. This can motivate students to take first aid training seriously and apply their knowledge in real-life situations.

IV. Provide ongoing opportunities for continuing education: First aid knowledge and practices can evolve with time, and medical students should have access to ongoing opportunities for continuing education and professional development. Medical schools can offer refresher courses, hands-on practice sessions, and access to online resources to help students stay up to date with the latest practices.

V. Foster a culture of collaboration and teamwork: First aid and emergency care often require the cooperation and collaboration of multiple healthcare professionals, including doctors, nurses, and paramedics. Medical schools should promote a culture of collaboration and teamwork among their students, emphasizing the importance of communication and coordination in emergencies.

Overall, first aid knowledge and practice are critical skills for medical students to acquire, as they prepare for their clinical practice. By incorporating first aid training in the curriculum, providing hands-on training, and emphasizing the importance of first aid in clinical practice, medical schools can help equip their students with the tools and knowledge they need to provide effective and efficient emergency care.

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Appendix I: Questionnaire

Republic of Yemen
Ministry of Higher Education and
Scientific Research
21 September University of Medical &
Applied Sciences
General Surgery Department

Questionnaire about Assessment of Knowledge and Practice Related to Burns and their First

among Medical Students of 21UMAS

Dear Doctor, we hope you are fine. We would like to take a minute from your time to have you answer this questionnaire.
In this questionnaire, we want to assess your knowledge of burns and their first aid ......
Please check one answer

A- GENERAL INFORMATION
1- Age in a year: ☐18-21 y ☐22- 24y ☐More than 25y. **2-Gender:** ☐ Male. ☐ Female.
3- your Academic year: ☐1st year. ☐2nd year. ☐3rd year. ☐ 4th year. ☐ 5th year.
4-Do you have any information about burns? If yes answer the following question: ☐Yes ☐No
5-The source of your information is: ☐Your college. ☐Social media. ☐Course. ☐School. ☐Other sources.
B-Knowledge and practice related to burns and their first aid
6-Burn injuries may arise due to exposure with: ☐Fire, Steam, Chemicals, Radiations, and Electric. ☐ Fire and electricity.   ☐Fire only. ☐ I don't know.
7-Types of burn injuries based on the degree of severity are: ☐1ST, 2ND Degree. ☐ 1st,2nd, 3rd, 4th degree.   ☐1st, 2nd, 3rd degree. ☐ I don't know.

8- Burns are classified as a minor burns if they involved:
☐ Total body surface = 10%.   ☐ Total body surface<10 %.
☐ Total body surface >10 %.   ☐ I don't know.

9-A burn is classified as a major burn if it involved:
☐ Total body surface = 10%.   ☐ Total body surface<10 %.
☐ Total body surface >10 %.   ☐ I don't know.

10-A burn is classified as a superficial burn if it affects .... skin layer:
☐ Epidermal.   ☐ Epidermal and dermal.   ☐ All lyres of skins.   ☐ I don't know.

11-A burn is classified as partial thickness burn if it affects .... skin layer
☐ Epidermal.   ☐ Epidermal and dermal.   ☐ All lyres of skins.   ☐ I don't know.

12-A burn is classified as full thickness burn if it affects:
☐ Dermal.   ☐ Dermal and subdermal.
☐ When penetrates the subcutaneous tissue under the skin.   ☐ I don't know.

13-Children are the most vulnerable to exposure to burns:
☐ True.   ☐ False.   ☐ I don't know.

14-What should be the immediate first aid step for a burn injury?
☐ Cool the burn wound.
☐ Removing the person from the source of the burn.
☐ Covering with warm sheets or blankets.
☐ I don't know.

15-Recommended temperature for water to be used for burns wound flushing:
☐ 12°C-18°C.
☐ 20- 25 °C.
☐ I don't know.

16-What is the recommended duration for a burn wound to be flushed with water?
☐ 5 minutes.   ☐ 1 hour.
☐ 10-minutes.   ☐ I don't know.

17-What is the best burn first aid to be applied at the moment of injury?
☐ Toothpaste.   ☐ Ice.   ☐ Cool water.   ☐ Egg.   ☐ Oil.   ☐ Other...............

18-Is it necessary to keep the body warm?
☐ Yes.   ☐ No.   ☐ I don't know.

19-At which degree of burn should the patient visit a hospital?
☐ 1st degree.   ☐ 3rd degree.   ☐ I don't know.

20- In case of burns, should you remove jewelry from the patient?
☐ Yes.   ☐ No.   ☐ I don't know.

21-Do you think home-based remedies shall be used as immediate first aid to relieve pain or burning?
☐ Yes.   ☐ No.   ☐ I don't know.

22- What should be done to prevent hypothermia in burn patients?
☐ Give the patient hot fluid.
☐ Covering with warm sheets or blankets.

☐I don't know.
23- The proper arrangements of first aid steps are: ☐Cover the patient, remove the clothes, stop the burn, and transport the patient to the hospital. ☐Remove the clothes, transport the patient to the hospital, and cover the patient. ☐Stop the burn, take the patient away from the burn, and if small burn cool it with water. ☐I don't know.
24- Would you be interested in learning more about the first aid of burns? ☐Yes.   ☐No.
25-Have you did health education for the community about burn first aid? ☐Yes   ☐No
26- what do you think about the level of community knowledge about burning? ☐Poor knowledge.   ☐Mild knowledge. ☐Good knowledge.   ☐I don't know.

Do you have any other comments:

1. …………………………………………………………..
2. …………………………………………………………..
3. …………………………………………………………..

Thanks a lot!