

# Prevalence and Triggers of Syncope among Undergraduate Students in a Nigerian University: A Cross-Sectional Study

Afuberoh Francis Chukwudi\*<sup>1</sup>, Edwin Nwobodo<sup>2</sup>, Ezeokafor Emmanuel Nonso<sup>3</sup>, Ikechukwu Maryann<sup>4</sup>, Anyaogu Charles Chinemeze<sup>4</sup>, Okoye Ogochukwu Fidelis<sup>5</sup>

<sup>1,2,3,4</sup> Department of Human Physiology, Faculty of Basic Medical Sciences, College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus, PMB 5001, Anambra, Nigeria.

<sup>5,6</sup> Department of Human Physiology, Faculty of Basic Medical Sciences, Chukwuemeka Odumegwu Ojukwu University, Uli Campus

\*Corresponding Author: Afuberoh FrChukwudiancis

Address: Department of Human Physiology, Faculty of Basic Medical Sciences, College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus, PMB 5001, Anambra, Nigeria.

DOI: <https://doi.org/10.5281/zenodo.17463984>

Published Date: 22-October-2025

---

**Abstract:** Syncope, defined as a transient loss of consciousness (TLOC) accompanied by an inability to maintain postural tone and followed by complete recovery, is caused by a temporary reduction in cerebral perfusion. It is a common clinical condition with varying prevalence across demographics and settings.

This study aimed to determine the prevalence, predisposing factors, causes, and triggers of syncope among undergraduate students of the College of Health Sciences, Nnamdi Azikiwe University, Nigeria.

A cross-sectional survey was conducted using a structured questionnaire distributed among 357 students. The participants included 146 males (40.9%) and 211 females (59.1%), aged between 16 and 30 years, with a mean age of  $24.23 \pm 0.84$  years.

Among the participants, 44 students (12.3%) reported experiencing syncope, while 313 (87.7%) had no history of syncope. Additionally, 52.7% experienced presyncope symptoms without actual fainting. Common triggers of presyncope included rapid postural changes, head turning, physical exertion, post-exercise recovery, sleep deprivation, medication use, heat exposure, and fasting or hunger. Reported underlying conditions associated with syncope included peptic ulcers, allergies, hypertension, pneumonia, anemia, chest pain, and asthma. The first episode of syncope was most frequently reported between the ages of 16 and 20 years. Notably, only a small percentage of individuals who experienced syncope sought medical attention.

Early recognition of syncope warning signs and the application of preventive strategies such as physical counter-pressure maneuvers, adequate hydration, and liberal salt intake can help reduce incidence. Further research is recommended in clinical and broader population-based settings, especially in developing countries where current data on syncope are limited or outdated.

**Keywords:** Prevalence, Presyncope, Students, Syncope, Triggers, Undergraduate.

---

## 1. INTRODUCTION

Syncope is a prevalent illness that encompasses many demographics and environments. Syncope is specifically defined as a decrease in blood pressure (BP) leading to global cerebral hypoperfusion, hence differentiating it from the broader category of "transient loss of consciousness (TLOC)." Fedorowski et al. (2023). Loss of consciousness results from a temporary reduction in blood flow to the Reticular Activating System (RAS) or global cerebral hypoperfusion, and its

resolution typically does not necessitate medical or electrical interventions. Presyncope is characterised by sensations of dizziness and lightheadedness without a loss of consciousness. The brain's metabolism is entirely reliant on continuous blood flow, and even a brief cessation of efficient circulation results in substantial changes in mental status within roughly ten seconds (Saedi, et al., 2013). Prevalence studies indicate that 40% of adults have experienced a syncope episode; however, accurately determining the incidence is difficult as many individuals with syncope do not seek medical attention (Guimaraes et al, 2018). The occurrence of the initial syncopal episode follows a bimodal distribution, with a primary peak in youth (ages 10-30) and a secondary peak after 65 years of age (Jaume et al, 2023). The pathophysiology of all types of syncope is identical, notwithstanding the variations in their triggers. A diminished venous return to the heart initiates a response, prompting mechanoreceptors in the left ventricle to transmit signals to the central nervous system. Ultimately, the signals would induce an elevation in parasympathetic tone and a reduction in sympathetic tone, resulting in loss of consciousness (Alghamdi et al., 2022). Syncope is significant as it may be associated with life-threatening conditions (e.g., total heart block or persistent ventricular tachycardia), but at the other end of the spectrum are people experiencing benign episodes, such as uncomplicated fainting (Burn 1995). A significant number of syncope episodes remain unreported or are subsequently evaluated by family physicians, who predominantly provide merely reassurance when necessary. This study seeks to ascertain the prevalence and susceptibility to syncope among undergraduate students at the College of Health Sciences, Nnamdi Azikiwe University, Nigeria.

## 2. MATERIALS AND METHODS

This cross-sectional study was conducted among undergraduate students of the College of Health Sciences, Nnamdi Azikiwe University, Okofia, Nnewi, Anambra State, Nigeria. The study was carried out over a period of seven weeks, from 10th January to 29th February 2024.

### Study Population and Sampling

Participants were drawn from various departments and levels within the College of Health Sciences. The inclusion criteria were undergraduate students who were willing to participate and present during the period of data collection. Convenience sampling was employed to reach as many students as possible within the study period.

### Research Instrument

A structured, self-administered questionnaire was used as the research instrument. The questionnaire was designed to obtain relevant information related to the occurrence and characteristics of syncope among the students. Prior to distribution, participants were given a brief explanation of what syncope is and the purpose of the study. They were also encouraged to respond honestly and to the best of their knowledge.

### Questionnaire Structure

The questionnaire was divided into four sections:

Section A: General demographic information (e.g. age, sex, department, level)

Section B: Possible causes and triggers of syncope

Section C: Information on duration, frequency, and any interventions during syncope episodes

Section D: History of underlying medical conditions and family history related to syncope

### Data Collection Procedure

Data were collected through direct distribution of the questionnaires to students within lecture halls and department offices. Completed questionnaires were retrieved on the spot or within a few days, depending on availability.

### Ethical Considerations

Informed consent was obtained from all participants before participation. The nature and objectives of the study were clearly explained to them. Participation was voluntary, and all data collected were kept confidential and used solely for academic purposes.

### Data Analysis

Data obtained from the questionnaires were first entered and organized using Microsoft Excel. Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS), version [insert version used, e.g., 25.0]. Descriptive statistics, including frequencies and percentages, were used to summarize the data.

For comparison between groups, non-parametric tests were employed: the Mann–Whitney U test was used to compare differences between two independent groups, while the Kruskal–Wallis test was used for comparisons involving more than two groups. A p-value  $\leq 0.05$  was considered statistically significant.

### 3. RESULTS

**Table 4.1: Socio-demographic information of participants in this population study**

Variable	Frequency (N)	Percentage (%)
<b>Gender</b>		
Male	146	40.9
Female	211	59.1
Total	357	100
<b>Age group (years)</b>		
16-20	94	26.3
21-25	236	66.1
26-30	27	7.6
<b>Have you fainted before?</b>		
Yes	44	12.3
No	313	87.7

Table 1: Socio-demographic Characteristics of Participants (N = 357)

Descriptive statistics were used to summarize the data, including frequencies and percentages of key variables such as gender, age group, and history of syncope.

**Table 4.2: Distribution of population that have experienced (syncope) with respect to gender**

Variable	Category (Gender)	N	Mean Rank	p-value (2-tailed sig.)
Population that have experienced syncope	Male	146	181.44	0.51
	Female	211	177.31	
	Total	357		

Data were analyzed using the Mann–Whitney U test. A p-value  $\leq 0.05$  was considered statistically significant.

**Table 4.3: Distribution of population that have experienced (syncope) with respect to age groups**

Variable	Category (Age group)	N	Mean Rank	p-value (2-tailed sig.)
Population that have experienced syncope	16-20years	94	157.78	0.29
	21-25years	236	167.41	
	26-30years	27	147.70	
		357		

Data were analyzed using the Kruskal–Wallis test. A p-value  $\leq 0.05$  was considered statistically significant.

**Table 4.4: Showed the prevalence of warning and accompanying signs of syncope across population study**

Variable	Frequency (N)	Percentage (%)
<b>Warning signs of syncope</b>		
Did you experience total loss of consciousness when you fainted?		
Yes	42	11.6
No	321	88.4
Have you experienced symptoms of fainting (presyncope) but did not faint before?		
Yes	191	52.7
No	172	48.2
Did you notice any warning signs (aura) before the syncope (fainting) episode?		
Chest discomfort	8	2.2
Visual blurring	26	7.2
Cold sweating	14	3.9
Head turning and dizziness	20	5.5
Bleeding	3	0.8
How long did the warning sign last?		
Less than 5minutes	47	13.1
Less than an hour	11	3.0
1- 5hours	2	0.6
More than 5hours	5	1.4
<b>Signs accompanying syncope</b>		
If yes to experiencing presyncope, which of the following occurred?		
Dizziness	93	25.6
Blurry vision	56	15.4
Nausea	16	4.4
Lightheadedness	13	3.6
Impending doom	43	11.8
<b>Did you fall down when you fainted?</b>		
Yes	38	10.5
No	44	12.1

**Table 4.5: Showed the prevalence of causes and triggers of syncope across population study**

Variable	Frequency (N)	Percentage (%)
<b>If you have experienced presyncope or near syncope, what triggered it?</b>		
Standing up too quickly	34	9.4
Head turning	11	3.0
During exercise	5	1.4
Post-exercise	8	2.2
Lack of sleep	24	6.6
Not eating/hunger	70	19.3
Medication	4	1.1
Heat	14	3.9
<b>What caused your syncope (faint episode)?</b>		
Stress	10	2.8
Dehydration	32	5.8
Crowding	5	1.8
Pain	5	1.8
Emotional circumstances	1	0.3
<b>How often do you experience syncope (fainting) episodes?</b>		
Never	214	59
Rarely	90	24.8
Ocasionally	44	12.1
Frequently	6	1.7
Regularly	0	0
<b>How old were you when you first experienced syncope?</b>		
Not at all	231	63.7
1-5years old	10	2.8
6-10years old	6	1.7
11-15years old	26	7.2
16-20years old	58	16.1
21years and above	13	3.6
I can't remember	19	5.2
<b>Diagnosed of any underlying ailment that could cause syncope</b>		
Ulcer	2	25
Allergies	1	12.5
High blood pressure	1	12.5
Pneumonia	1	12.5
Anemia	1	12.5
Chest pain	1	12.5
Asthma	1	12.5
<b>Have any of your family members fainted?</b>		
Yes	41	14
No	316	86
<b>Does your family have a history of recurrent syncope?</b>		
Yes	15	4.1
No	342	95.9

**Table 4.6: Showed the Duration and Interventions of syncope experiences across population study**

Variable	Frequency (N)	Percentage (%)
<b>Did you experience total loss of consciousness when you fainted?</b>		
Yes	20	5.6
No	45	12.4
<b>How long did the loss of consciousness last?</b>		
Few seconds	9	2.5
Few minutes	23	6.3
I don't know	5	1.4
<b>How were you revived?</b>		
Regained consciousness through rest	7	2.0
Rushed to the hospital	24	6.6
Taken to a pharmaceutical /drug store	3	0.9
Poured cold water	20	5.5
Exposed to fresh air	3	0.9
Took in fluid like water, solutions etc.	5	1.5
Applied Balm	1	0.3
Tapped and called upon	3	0.9
<b>Sought for medical attention post-syncope episode?</b>		
Yes	32	8.9
No	44	12.1
<b>Recover rapidly and completely from syncope episode?</b>		
Yes	37	10.2
No	34	9.4

**RESULT:**

Table 4.1 showed that three hundred fifty-seven participants with the mean age value of  $24.23 \pm 0.84$  years were involved in this research study. Male and female participants involved were 146(40.9%) and 211(59.1%) respectively.

Table 4.2 shows the distribution of participants who had experienced syncope in relation to gender. The mean rank for males was 181.44, while for females it was 177.31. Statistical analysis using the Mann–Whitney U test revealed no significant difference between the genders ( $p = 0.51$ ).

Table 4.3 displays the distribution of participants who had experienced syncope according to age group. The highest mean rank was observed among participants aged 21–25 years (167.41), followed by those aged 16–20 years (157.78), and the lowest among those aged 26–30 years (147.70). However, analysis using the Kruskal–Wallis test showed no statistically significant difference among the age groups ( $p = 0.29$ ).

**4. DISCUSSION**

Syncope is a prevalent diagnostic with a lifetime cumulative incidence in the general population; it is a clinical illness characterised by a transient and self-limiting loss of consciousness resulting from insufficient cerebral perfusion. This study revealed the prevalence of syncope, commonly referred to as fainting, among undergraduate students at the College of Health Sciences, Nnamdi Azikiwe University, Anambra State, Nigeria. This study comprised 357 students, including 146 men (40.9%) and 211 females (59.1%), with an age range of 16 to 30 years and a mean age of  $24.23 \pm 0.84$  years. Of the 357 participants, only 44 (12.3%) suffered syncope, while the rest 313 (87.7%) did not. This study, with a prevalence of 12.3%, contrasts with the findings of Ajuwabiri et al. (2023), which examined the knowledge and awareness of syncope among the general population in the Makkah region in Saudi Arabia, revealing that one-third (33%) of their population had experienced syncope. Alghamdi et al. (2022) examined the knowledge and awareness of syncope within the Riyadh community, revealing that 36% of participants had experienced syncope at some point in their lives. The study revealed that 191 participants (52.7%) experienced presyncope or close syncope without having undergone syncope, corroborating the findings of Moya et al. (2009) and Yvonne et al. (2014). The study's findings indicated that participants who experienced

presyncope reported symptoms such as dizziness, blurry vision, nausea, lightheadedness, and a sense of impending doom, consistent with the research conducted by Chung et al. (2011), which identified lightheadedness and dizziness as particularly prevalent symptoms. This study identified common triggers of presyncope as: rapid standing, head rotation, exercise, post-exercise, sleep deprivation, medications, heat exposure, and hunger, the latter being the most significant and consistent with Saedi et al. (2013), which elucidated that the brain's metabolism is entirely reliant on continuous blood flow, and even a brief interruption in effective circulation can result in substantial changes in mental status within approximately 10 seconds. The research study indicated that the majority of subjects observed warning symptoms (aura) prior to the syncope event, which encompassed visual blurring (7.2%), head tilting and dizziness (5.5%), chest discomfort (2.2%), cold sweating (3.9%), and blood (0.8%). The warning indications persisted for an average duration of under 5 minutes. The study's findings identified the causes of syncope, including stress, crowding, pain, and emotional factors, with dehydration being the most significant. This aligns with Alghamdi et al. (2022), who asserted that the primary cause of unconsciousness is insufficient delivery of cerebral nutrients and oxygen. This work parallels Jaume et al.'s (2023), which demonstrated the first dispersion of syncopal episodes. This study indicated that the majority of patients do not pursue medical attention, which may not substantiate the distinctiveness of syncope incidence, consistent with Guimaraes et al. (2018). This research investigation identified underlying conditions that may lead to syncope, including ulcers, allergies, hypertension, pneumonia, anaemia, chest discomfort, and asthma. This aligns with Amir et al. (2024); thus, it is crucial to ascertain the aetiology of syncope and any associated pathologies. This study indicated that syncope recurs at a frequency of 1.7% frequently, 12.1% occasionally, and 24.8% infrequently. Most participants erroneously conflated presyncope with syncope. This research demonstrates familial history: Fourteen percent of the participants' family members had experienced syncope, whereas 4.1% of the participants' families had a history of recurrent syncope. The study findings indicated that 5.6% suffered total loss of consciousness, with durations of a few seconds (2.5%), a few minutes (6.3%), and 1.4% of subjects unaware of the duration of their loss of consciousness. Participants exhibited a whole and swift recuperation from syncope episodes at a rate of 10.2%, corroborating the findings of Saedi et al. (2013), who asserted that recovery from syncope does not necessitate medical or electrical intervention. The study indicated that 10.5% reported falls during episodes of syncope. The recovery of participants from syncope episodes revealed notable details; in response to the question "How were you revived?" the answers included: revived through rest, transported to the hospital, taken to a pharmacy, doused with cold water, exposed to fresh air, administered fluids such as water and solutions, applied balm, tapped, and summoned assistance. It was observed that the majority of participants conflated presyncope with syncope when responding. Study results suggested that 8.9% of participants sought medical assistance following a syncope episode. The study's findings indicated that the majority of participants who suffered syncope also encountered presyncope.

## 5. CONCLUSION

This study reveals that presyncope is more widespread than syncope, with many individuals erroneously conflating the two. Presyncope is mostly induced by factors such as hunger, sleep deprivation, and rapid postural changes. The primary causative factors of syncope are dehydration and stress, along with potential underlying conditions such as ulcers, allergies, hypertension, chest discomfort, anaemia, pneumonia, and asthma. The initial syncopal episode occurred between the ages of 16 and 20, which represents the highest prevalence among individuals who had experienced syncope. The study also indicated that a minimal percentage of individuals seek medical assistance for their syncope episodes. Additional research must be conducted primarily in developing countries, as there is a deficiency of scholarly materials on syncope, and it should also be undertaken in clinical environments, general hospitals, or on a national scale.

## 6. RECOMMENDATIONS

Based on the findings of this study, the following recommendations are proposed:

Health education programs should be implemented within the university to raise awareness about syncope, its warning signs, and common triggers such as dehydration, hunger, and lack of sleep.

Students who experience recurrent or unexplained fainting episodes should be encouraged to seek proper medical evaluation to rule out underlying cardiovascular, neurological, or metabolic disorders.

Basic first aid training should be included in student orientation programs to equip peers with knowledge on how to assist someone who faints.

Further studies using clinical assessment and physiological monitoring are recommended to better understand the underlying mechanisms and risks associated with syncope in this population.

### Limitations of the Study

This study had several limitations that should be considered when interpreting the results:

Self-reported data may have introduced recall bias, as participants had to remember and report past experiences of syncope and related symptoms.

The study was limited to students from one university department, which may affect the generalizability of the findings to other populations or institutions.

No clinical confirmation (e.g. medical records, diagnostic testing) was used to verify the reported cases of syncope, which could result in over- or underestimation of prevalence.

The cross-sectional design does not allow for determination of causality between reported risk factors and syncope occurrence.

### ACKNOWLEDGMENTS

We wish to express our sincere gratitude to all the undergraduate students of the College of Health Sciences, Nnamdi Azikiwe University, who participated in the study. Appreciation also goes to the academic and non-academic staff of Human Physiology Department, who provided support during the data collection process. Special thanks to the ethics review committee of Nnamdi Azikiwe University for approving the study protocol.

### REFERENCES

- [1] Alifiya Aamir, MBBS, Yumna Jamil, MBBS, Maham Bilal, MBBS, Mufaddal Diwan, MBBS, Abdulqadir J. Nashwan, RN, MSc, and Irfan Ullah, MBB (2024) Artificial Intelligence in Enhancing Syncope Management - An Update Curr Probl Cardiol, 2024, 49:102079, pp. 1-12
- [2] Alfonso Lagi, Simone Cencetti, and Alessandro Cartei (2011) What Happens before Syncope? Study of the Time Frame Preceding Vasovagal Syncope International Scholarly Research Network, ISRN Cardiology, 659787, pp.1-5.
- [3] Artur Fedorowski, Piotr Kulakowski, Michele Brignole, Frederik J. de Lange, Rose Anne Kenny, Angel Moya, Giulia Rivasi, Robert Sheldon, Gert Van Dijk, Richard Sutton, and Jean-Claude Deharo (2023), Twenty-five years of research on syncope, European society of cardiology, 25, pp.1–13.
- [4] Boron W., & Boulpaep E. (2008), Medical Physiology 2nd. Ed. Amsterdam Elsevier 2008.
- [5] Brignole M., Moya A., de Lange FJ, Deharo JC, Elliot PM, Fanciulli A, Furlan R, Kenny RA, Martin A, Probst V, Reed MJ, Rice CP, Sutton R, Ungar A, van Dijk JG (2018), ESC Scientific Document Group.2018 Esc Guidelines for the diagnosis and management of syncope, Eur Heart J, 39, pp. 1883-1948.
- [6] Brown CM & Hainsworth R (1999), Assessment of Capillary Fluid Shift during Orthostatic Stress in Normal Subject and Subject with Orthostatic Intolerance, clinical Auton Res, 9, pp. 69-73.
- [7] Daniela S. MD, & Blair P. G. MD (1993), Head-Upright Tilt Table Testing For Recurrent, Unexplained Syncope, Clin. Cardiol, 16, pp. 763-767.
- [8] Diedrich A., & Biaggioni I. (2004), Segmental orthostatic fluid shifts, Clinical Auton Res 14, Pp. 6-7.
- [9] Erin L. W, Farhaan M. K & Victoria E. C. (2022), Counter pressure maneuvers for syncope prevention: A semi-systemic review and meta-analysis, Frontiers in Cardiovascular Medicine, 9(1016420), pp. 1-15.
- [10] Erlin Hu, Xiaoyan Liu, Qianqian Chen and Cheng Wang (2021) Investigation on the Incidence of Syncope in Children and Adolescents Aged 2–18, Years in Changsha, frontiers in Pediatrics, 9, pp. 1-7.
- [11] Giulia Rivasi, Andrea Ungar, Angel Moya, Michele Brignole, Richard Sutton, Artur Fedorowski (2021) Syncope: new solutions for an old problem, Kardiologia Polska, 79 (10) pp. 1068–1078.
- [12] Gudkova S., Cherepanova N., Duplyakov D., Golovina G., Khokhlunov S., Surkova E., Rotar O., Konradi A., Shlyakhto E. (2016) Lifetime Prevalence of Transient Loss of Consciousness in an Urban Russian Population, Arq Bras Cardiol, 106(5):382-388.

- [13] Hailey Gregson and Ana Ivkov (2021) Sex and age impact prevalence and symptoms of vasovagal syncope: Implications for accurate diagnosis, *Stem fellowship journal*, 7(2) pp. 13-15.
- [14] Jaume F. P., Pablo J. M., Jesus R. S. & Nuria R. G. 2023, Arrhythmic syncope: From diagnosis to management, *World J Cardiol*, 15(4).pp. 119-141.
- [15] Judith M. MacCormick, MBChB, Jackie R. Crawford, NZCS, Seo-Kyung Chung, PhD, Andrew N. Shelling, PhD, Cary-Anne Evans, MSc (Med), Mark I. Rees, PhD, Warren M. Smith, MBChB, Ian G. Crozier, MBChB, Hugh McAlister and Jon R. Skinner, MD (2011) *Heart, Lung and Circulation*, 20, pp.593–598.
- [16] Kamal Rahmouni (2022), Energy metabolism and syncope, *Clinical Autonomic Research*, 32, pp. 391-393.
- [17] Kamil K., Haldun A., Onder L., Asim O. E., Ozcan Y., Serdar B., Nergiz V. & Erden e. U, Comparison of existing syncope rules and newly proposed Anatolian syncope rule to predict short-term serious outcomes after syncope in Turkish population, *International Journal of Emergency Medicine* 5(17),pp. 1-9.
- [18] Kapoor W. N. (2002), Current evaluation and management of syncope, *Circulation*, 106, pp. 1606-1609.
- [19] Karsten K., Lukas H., Thomas M., Mir A. O & Christine E-K., (2018), Syncope in hemodynamically stable and unstably patients with acute pulmonary embolism- Results of the German nationwide inpatient sample, *Scientific Reports*, 8(15789), pp 1-11.
- [20] Katsufunmi N., Sean K. H & Jinichi T. (2008), Laugh syncope as a rare sub-type of the situational syncope: a case report, *Journal of Medical Case Reports*, 2 (197), pp. 1-4.
- [21] Lewis T. (1932), Vasovagal syncope and the carotid mechanism, *British Medical Journal*, 87(1), pp. 3-6.
- [22] Lin L. MD, Tingting F. MD, Xiaofeng X. MD & Zicheng L. MD (2021), Etiology, risk factors, and prognosis of patients with syncope: A single-center analysis, *Ann Noninvasive Electrodiol* 26(e12891), pp.1-8.
- [23] Manyari D. E, Rose S., Tyberg J.V., & Sheldon R.S (1996), Abnormal reflex venous function in patients with neuro-mediated syncope. *JAM Coll Cardiol*.27 (17), pp. 30-35.
- [24] Martina R., Giuseppe D. T, Giulia R., & Andrea U. (2021), Evaluation of patients with Syncope in the Emergency Department: How to Adjust Pharmacological Therapy, *Medicina*, 57(603), pp.1-9.
- [25] Melani S., Antonios P.A, Nikolas F. & Vassilos V. (2021), Is the Adenosine Test Obsolete in the Clinical Assessment of Syncope of Unknown Origin, *Arrhythmia & Cardiology Review*, 10(4), pp. 230-233.
- [26] Michele B., Giulia R., Arthur F, Marcus S., Antonella G., & Andrea U. (2023), Test for identification of reflex syncope mechanism, *Expert Review of Medical Devices*, 20(2), pp. 109-119.
- [27] Mohamed HA (2008), Syncope: Evaluation and management, *Libyan Journal of Medicine*, Vol 30, pp. 156-159.
- [28] Mohammad A. R., Mohammad F., Zahra E., Hassan., & Abolfath A. (2014), Predicting the outcome in patients with unexplained syncope and suspected cardiac cause: Role of electrophysiologic studies, *Turkish Society of Cardiology*, 5306, pp. 213- 217.
- [29] Mohannad A. Alghamdi, Faisal A. Alshahrani, Faisal A. Aldihan, Nawaf M. Alamer, Fahad A. Al Dihan, Aamir Omair, Ihab Suliman, Mohamud Mohamud (2022) Knowledge and Awareness of Syncope Among the Population of Riyadh: A Cross-Sectional Study. *Cureus* 14(8): e28499.
- [30] Moya A., Suttoon R., Ammirati F., Blanc J.J, Brignole M., Dahm J.B., Deharo, J.C., Gajek, J., Gjesdal K., A. Krahn, M. Massin, M. Pepi, T. Pezawas, R. Granell, F. Sarasin, A. Ungar, J. G van Dijk, (2009), Guidelines for the diagnosis and management of syncope (version 2009), *European Heart Journal*, 30, pp. 2631-2671..
- [31] Nynke van Dijk, MD, PhD Kimberly R. Boer, MSc., Wouter Wieling, MD, PhD, and Mirjam A. Sprangers, PhD, Mark Linzer, MD (2007) Reliability, Validity and Responsiveness of the Syncope Functional Status Questionnaire 2007, *Society of General Internal Medicine*, 22, pp. 1280–1285.
- [32] Parisa T., Giulia R., Viktor H., Andrea U., Richard S., Michele B. & Arthur F. (2022), Early and late-onset syncope: insight into mechanisms, *European Heart Journal*, 2022(43), pp. 2116-2123.

- [33] Peter V., Jean B. G, Frank B., Stefaan B. & Bert A (2011), Incidence and outcome of first syncope in primary care: A retrospective cohort study, *BMC Family Practice*,12(102), pp. 1-4
- [34] Rawan Aljuwaybiri , Fatima A. Almekhlafi , Rawan M. Alzahrani , Reham T. Almehmadi , Marwah
- [35] Y. Alsubhi , Asayel T. Alruwais , Mokhtar M. Shatla, Knowledge and Awareness of Syncope Among General Populations of Makkah Region in Saudi Arabia: A Cross-Sectional Study, *Cureus*, 15(4): e38276.
- [36] Rose M. F. L. da Silva (2014), Syncope: epidemiology, etiology, and prognosis, *Frontiers in Physiology*, 5 (471), pp. 1-4.
- [37] R. B Guimaraes, V. Essebag, M. Furlanetto, J. P. G Yanez, M. G Farina, D. Garcia, E. D Almeida, L. Stephan, G. G. Lima, and T. L. L. Leiria (2018), Structural heart disease as the cause of syncope, *Brazilian Journal of Medical and Biological Research*, 51 (4), pp. 1-7.
- [38] Ryan J. K, MD, Wayne O. A, MS, FACC, David G. B, MD, FACC, FRCPC, FHRS, FESC (2017), Syncope and risk of sudden cardiac death: Evaluation, management and prevention, *Journal of Arrhythmia*, 33, pp. 533-544.
- [39] Saklani P.,MBBS, Andrew K., MD, George K., MD (2013), *Circulation*, 127, pp. 1330-1339.
- [40] Sedigheh Saedi, Saied Oraii, and Farhad Hajsheikholeslami (2013), A Cross Sectional Study on Prevalence and Etiology of Syncope in Tehran, *Acta Medica Iranica*, 51(10), pp. 715-719.
- [41] Soteriades E S., Evans J C., Larson M G., Chen M H., Chen L., Benjamin E J., Levy D. (2002), Incidence and Prognosis of Syncope, *N Engl Med*, 347, pp. 878-885.
- [42] Sung Ho Lee, Seung-Jung Park, Kyeongmin Byeon, Young Keun On, Hye Ran Yim, and June Soo Kim (2013), Prevalence and Clinical Factors of Anxiety and Depression in Neurally Mediated and Unexplained Syncope, *Yonsei Med J*, 54 (3) pp. 583-589.
- [43] Sutton R., van Dijk N., Wieling W. (2014), Clinical History in Management of Suspected Syncope: a powerful diagnostic tool, *Cardiol J*, 21 (65), pp. 1-7.
- [44] Wang Y., Junbao D., & Ying L., (2020), Comorbidity of Neurally Mediated syncope and Allergic Disease in Children, *Frontiers in Immunology* 11, (1865), pp. 1-7.
- [45] W Arthur, G C Kaye (2000), The pathophysiology of common causes of syncope, *Postgrad Med J*, 76, pp.750- 753.
- [46] W.A Hoefnages, G. W Padberg, Jouerheg, R. A. C Roos, J. G van Dijk, & H.A. C Kamphuisen (1991),*Journal of neurology, neurosurgery & Psychiatry* 54, pp. 953-956..
- [47] Wouter W., Roland D. T, N. V. Dijk, Arthur A . M. W., David G. B., & J. Gert V. D (2009), Symptoms and signs of syncope: a review of the link between physiology and clinical clues, *Brain; A Journal of Neurology*, 132, pp. 2630-2652.
- [48] Yvonne Greve, Felicitas Geier, Steffen Popp, Thomas Bertsch, Katrin Singler, Florian Meier, Alexander Smolarsky, Harald Mang, Christian Müller, Michael Christ (2014), The prevalence and prognostic significance of near syncope and syncope—a prospective study of 395 cases in an emergency department (the SPEED Study), *Dtsch Arztebl Int*, 111(12), pp. 197–204.