PUBLIC HEALTH EDUCATION

A Study to Assess the Effectiveness of a Structured Teaching Program on Knowledge Regarding the Golden Hour in Road Traffic Accidents Among Undergraduate Students in Selected Colleges of Satara District

Samrudhi Deepak Samudre, Trupti Santosh Shirale, Harshada Dattatraya Suryawanshi, Agnes Nagendra Taksande, Manjusha M. Samudre, Pranav V. Raut

Published November 2026

Abstract

Road Traffic Accidents [RTA] are a major public health concern and a leading cause of death, disability and economic burden worldwide. The Golden Hour, first 60 minutes following traumatic injury, is a crucial period for reducing mortality and improving recovery outcomes. Lack of awareness regarding the Golden Hour may delay appropriate first-aid, rapid transportation and prompt medical treatment during this period. Therefore, educating adults about the Golden Hour is essential. The study aimed to assess the effectiveness of Structured Teaching Program [STP] on knowledge regarding the Golden Hour in RTA among undergraduate students in selected colleges of Satara district. The objectives were to assess pre-test and post-test knowledge scores, evaluate the effectiveness of STP, and determine the association between demographic variables and knowledge scores.

A quantitative research approach was adopted using a pre-experimental one-group pre-test and post-test design. A total of 150 undergraduate students were selected using a convenient sampling technique. Data was collected using a structured knowledge questionnaire consisting of 15 Multiple Choice Questions [MCQ]. After the pre-test, the STP was administered, followed by post-test. Descriptive and inferential statistics were used for data analysis. The findings revealed that before the intervention, 61.33% of students had average knowledge, 24.67% had poor knowledge, and none had excellent knowledge scores. The mean pre-test knowledge score was 5.96 ± 2.22, which increased significantly to 13.01 ± 2.40 in the post-test. The calculated paired t value was 28.311 with a p value < 0.0001, indicating a highly significant improvement in knowledge. No significant association was found between demographic variables and knowledge scores. The study concluded that STP is an effective intervention to improve knowledge regarding the Golden Hour.

1 Introduction

We live in a dynamic world. Commuting from one destination to another is convenient due to transportation facilities. The 21st century has witnessed unprecedented globalization, rapid urbanization, and remarkable advancements in transportation systems. Improved road networks, increased vehicle ownership, and enhanced connectivity have facilitated economic growth, trade, tourism, and social interaction across the globe. However, the benefits of globalization and motorization have been accompanied by a significant increase in RTAs, which have emerged as

"On the parable of the Good Samaritan: The first question the priest and Levite asked was, 'If I stop to help this man, what will happen to me?' But, by the very nature of his concern, the Good Samaritan reversed the question: "If I do not stop to help this man, what will happen to him?"[2]

Martin Luther King Jr

Road traffic accidents have become a major cause of mortality, morbidity, disability, and economic loss across the globe. Worldwide, nearly 1.2 million people are killed in road traffic crashes every year and about 20 million to 50 million are injured or disabled. These injuries account for 2.1% of global mortality and 2.6% of all disability-adjusted life years (DALYs) lost.[3]

These statistics highlight the urgent need for effective preventive strategies, public education, and road safety interventions.

1.1 Background of the study

According to the Ministry of Road Transport and Highways (MoRTH),1, 68,491 people were killed, and 4,43,366 injured in 4,61,312 road crashes in India in 2022. India witnessed 1,263 road crashes and 461 deaths every day or 53 crashes and 19 deaths every hour in that year. It is essential that both drivers and pedestrians understand the significance of the golden hour and know how to respond in emergency situations. Responsibility does not rest solely with emergency services; every individual plays a crucial role in ensuring that the golden hour remains effective.[4]

M Peden, L Sminkey in 2004 conducted a study among low income and middle-income countries and found that about 85% of the deaths and 90% of the Disability-Adjusted Life Years (DALY's) lost annually as a result of road traffic crashes. Projections indicate that these figures will increase over the next 20 years. Without appropriate action, by 2020, road traffic injuries are predicted to be the third leading contributor to the global burden of disease ahead of other health problems.[5]

In the year 2024 **S. S. Charkha, C. R. Rathod, A. T. Gavhane, et al.** conducted a study in Pune on road accident. Analysis was done for the past 3 years on NH-48 [140.300 km] commonly referred to as the Golden Quadrilateral highway. It has been found that a Black Spot is along six lanes of NH-48 contributing to road accidents which include human error, such as speeding, reckless driving, and impaired driving, as well as road infrastructure deficiencies, vehicle defects, and inadequate enforcement of traffic laws.[6]

In the year 20222 **Shilpa Gaikwad et al**. conducted a study in Sangli among 315 RTA victims, approximately 49.2% (n=155) of patients were between the 29-48-year age group. Male (87%; n=276) predominance was observed. We observed 46% (n=144) of accidents on weekend days and found alcohol consumption in 45% (n=142). Around 61% (n=193) of accidents occurred within 50 km of our hospital. Only 20.6% (n=65) of patients reached a healthcare facility within the golden hour.[7]

1.2 Need for the study

The Agenda for Sustainable Development has set an ambitious target of reducing road traffic deaths and injuries by 50% by 2030. [8]

Road traffic injuries are the leading cause of death among children and young adults aged 5–29 years. Yet two thirds of road traffic fatalities occur among people of working age (18–59 years). Nine in 10 fatalities on the roads occur in low- and middle-income countries, even though these countries have around 60% of the world's vehicles.[3]

Emergency Medical Services [EMS] responding to Road Traffic Injury [RTI] incidents in 2025 reported that the mean transport times from the scene to the hospital were significantly longer for interurban incidents (17.1 vs. 6.3 minutes, $p < 0.001$). The mean of total pre-hospital time was 37.2 (+/-17.2) minutes with a median of 32.0. Overall, 72.5% of the response interval time was less than eight minutes .[9]

Further research is required on needs-to and access-for EMS on city and interurban roads. The notification interval seems to be a hidden part of the post-crash events and indirectly affects the

"Golden hour" for victim management and it needs to be measured through the establishment of the surveillance systems.[10]

In 2025, Maharashtra recorded 15,549 deaths in 14,440 fatal accidents, compared to 15,715 deaths in 14,565 fatal crashes in 2024. Road fatalities, however, have shown an overall rising trend since 2020, when 11,569 people lost their lives in accidents, the report showed. Over speeding was a leading cause of deaths in 2023 accounting for 1.17 lakh of 4.81 lakh accidents. Maharashtra has a vehicular population of over 4.5 crore and has witnessed a rise in road accidents for 6th straight year until 2025. [11]

In 2025, road traffic crashes resulted in approximately 1.19 million deaths around the world and resulted in 20 to 50 million people with non-fatal injuries among vulnerable road users, such as pedestrians, cyclists and motorcyclists as per WHO. [3]

RTA related death and disability are alarming health issues globally, which are rapidly increasing in developing countries. Timely presentation to a health center and prompt medical care are needed to prevent mortality and morbidity related to RTAs.[7]

1.3 Problem statement

“A study to assess the effectiveness of Structured Teaching Program on knowledge regarding Golden Hour in Road Traffic Accident among undergraduate students in selected colleges of Satara District.”

1.4 Objectives of the study

1. To assess the pre-test knowledge scores on the Golden Hour in RTA among undergraduate students in selected colleges of Satara District.
2. To assess the post-test knowledge scores on the Golden Hour in RTA among undergraduate students in selected colleges of Satara District.
3. To evaluate the effectiveness of STP on the Golden Hour in RTA among undergraduate students in selected colleges of Satara District.
4. To find the association between socio-demographic variables and pre-test and post-test knowledge scores on the Golden Hour in RTA among undergraduate students in selected colleges of Satara District.

1.5 Research hypothesis

H0: There will be no significant difference between the pre-test and post-test knowledge score after administration of STP on Golden Hour among undergraduate students of selected colleges in Satara District.

H1: There will be a significant difference between the pre-test and post-test knowledge scores after administration of STP on Golden Hour among undergraduate students of selected colleges in Satara District.

1.6 Operational definitions

1.6.1 Assess

According to Oxford Dictionary:

Assess refers to judge or form an opinion about something. [12]

In this study:

Assess refers to evaluate the values, importance or quality of knowledge of Golden Hour among adults.

1.6.2 Effectiveness

According to Oxford Dictionary:

Effectiveness refers to the fact of producing the result that is wanted or intended; it is the quality of producing a successful result. [13]

In this study:

Effectiveness refers to the extent to which Structural Teaching Program achieves the desired effect in terms of gained knowledge.

1.6.3 Structured Teaching Program

According to Wisdom Library Dictionary:

Structured Teaching Program refers to a systematically organized, planned series of instruction or events designed to deliver specific knowledge or skills.[14]

In this study:

Structured Teaching Program refers to, the systematically planned teaching on the Golden Hour in RTA.

1.6.4 Knowledge

According to Merriam-Webster Dictionary:

Knowledge refers to the information, understanding, and skills gained through education or experience. [15]

In this study:

Knowledge refers to the information, understanding gained through STP on the Golden Hour.

1.6.5 Undergraduate student

According to Oxford Dictionary:

Undergraduate Student refers to a university or college student who is studying for their first degree.[16]

In this study:

Undergraduate Student refers to an undergraduate student who is studying in any stream except a medical stream.

1.6.6 College

According to Oxford Dictionary:

College refers to an institution for higher education or technical training after secondary school.[17]

In this study:

College refers to an institution offering Arts or Commerce courses after higher secondary education.

1.7 Assumptions

Undergraduate students may or may not have adequate knowledge regarding the Golden Hour in RTA.

1.8 Limitations

- The study was limited to Satara District.
- Undergraduate students of selected colleges in Satara District.
- Undergraduate students who were available at the time of data collection.

1.9 Delimitations

The study was delimited to undergraduate students studying in selected colleges of Satara District.

1.10 Conceptual framework

"A conceptual framework lays out the key factors, constructs or variables and presumes relationships among them"-Miles and Huberman (1994).[18]

Conceptual Framework is a theoretical approach to the study of the problem that is scientifically based, which emphasizes the selection, arrangement and classification of its concept. It helps to stimulate research and the extension of knowledge by providing both direction and impetus. Conceptual framework is the precursor of a theory. It provides a broad perspective for nursing practice, research and education. For this study, Von Bertalanffy's General System Theory was selected to represent the holistic framework.[19]

1.10.1 Von Bertalanffy's general system theory

The General System Theory was first introduced by Von Bertalanffy in 1968 which involves the concepts of input, throughput, output and feedback. There are varying degrees of interactions within the environment from which the system receives input and processes and provides output in the form of matter, energy and information.[20]

Input refers to matters and information which is continuously processed by the system. After processing the input, the system returns output to the environment in the form of environmental responses to it's systems. Output is used in adjustments, corrections and accommodation to the interaction with the environment. Feedback may be positive, negative or neutral.[20]

The present study focuses on assessing the effectiveness of STP on knowledge regarding the Golden Hour in RTA among undergraduate students.

1.10.1.1 Input

Any type of input informs in the form of information or even the manual effort, which is processed by a system to get desired output.[20]

In this study, it refers to demographic variables such as age, gender, course, year of course, students who witnessed Road Traffic Accident, students who helped the victims of RTA, students whose close relatives are in medical field and pretest knowledge score.

1.10.1.2 Throughput

A simple logical explanation, the process in which the system employs to get a desired output is termed as throughput. [20]

In this study, it refers to the STP on the Golden Hour in RTA.

1.10.1.3 Output

It is the end product of the processing by the system. [20] In this study, output refers to post-test knowledge score. **FEEDBACK:**

Feedback is an evaluation of the production process of how effective the process has been and how effectively the process could be modified with other suggestions.[20]

In this study, feedback refers to change in the knowledge.

Figure 1. Conceptual framework based on the General System Theory by Ludwig Von Bertalanffy

2 Review of literature

A review of the literature is systematic identification, location, selection, and summary of written material containing information related to the research problem.[19]

The literature review is based on an extensive survey of books, journals and international nursing indexes. It provides a basis for further investigation, justifies the need for the study, and relates the findings of one study to another, thereby contributing to the development of comprehensive scientific knowledge within the discipline. A review of literature is a written summary of the existing knowledge of the research problem. A review of the literature is a key step in the research process.[19]

2.1 Definition

"A literature review is an account of what has already been established or published on a particular research topic by accredited scholars and researchers" -**University of Toronto, 2001**.[47]

This chapter deals with the selected studies, which are related to the objectives of the study. A review of literature was carried out which helped the investigators to develop a deeper insight into the problem, and gain information on what has been done in the past.

2.2 Related articles

Review of literature for the present study was collected and organized under the following sections:

Studies related to the effectiveness of STP. Studies related to the incidence of RTA.

Studies related to the knowledge regarding RTA.

Studies related to the importance of the Golden Hour in RTA. Studies related to the knowledge regarding the Golden Hour in RTA.

2.3 Studies related to the effectiveness of STP

1. Dr. Kanniammal C. and Mrs. Cecilia Vardhini (2016) conducted a study titled "Effectiveness of STP on Prevention of RTA and Its First Aid Management among School Children at a Selected School, Chennai." The study assessed the effectiveness STP among 60 school children aged 9–11 years using a one-group pre-test post-test design. Results showed a significant improvement in knowledge after the intervention, with 96% of children achieving adequate knowledge in the post-test compared to only 60% having adequate or moderately adequate levels of knowledge in the pre-test. The obtained t-value (23.2, $p < 0.05$) confirmed the effectiveness of the STP. The study concluded that STP is an effective method for improving knowledge regarding RTA prevention and first aid management among school children.[22]

2. Mrs. Dilshad Rashid and Mrs. Aisha Akhter (2017) conducted a study titled "Effectiveness of Structured Teaching Programme on Knowledge Regarding Prevention of RTAs among Adolescents in Selected Schools of Baramulla, Kashmir." Using a one-group pre-test-post-test design, 62 adolescents aged 13–18 years were assessed through a structured questionnaire. The findings showed a significant improvement in knowledge after the STP, with adequate knowledge increasing from 1.61% in the pre-test to 98.38% in the post-test ($p < 0.001$). The study concluded that the STP was highly effective in improving adolescents' knowledge regarding the prevention of RTA .[23]

3. Pulak Raj Shyamlan, Rajani Kumari, Rahul Kumar, and Ms. Nandini Bhumij conducted a study titled "Effectiveness of Structured Teaching Program on Knowledge Regarding Prevention of RTAs among Students at GNSU, Rohtas." Using a one-group pre-test-post-test design, 60 students were assessed for their knowledge of RTA prevention. The results showed a significant increase in mean knowledge scores from 17.8 (pre-test) to 22.66 (post-test). The study concluded that the STP was effective in improving students' knowledge and awareness regarding RTA prevention.[24]

4. Ms. Sanjata Ganapati Naik and Mrs. Jaisha Hadlin D'Souza (2023) conducted a study titled "Effectiveness of Structured Teaching Programme on Knowledge Regarding Road Safety Measures Among school-going children in Selected Schools of Udupi." Using a one-group pre-test post-test design, 60 school children were assessed through a structured questionnaire. The findings revealed a significant improvement in knowledge, with mean scores increasing from 58.1% in the pre-test to 90.6% in the post-test. The study concluded that the Structured

Teaching Program was highly effective in enhancing knowledge regarding road safety measures among school children.[25]

1. Jayavel M. and Lizy Merlin Lisha (2014) conducted a study titled "Knowledge and Attitude Regarding Prevention of RTAs among Adolescents." Using a quasi-experimental one-group pre-test post-test design, 150 adolescents were assessed before and after a Structured Teaching Programme (STP). The results demonstrated a significant improvement in both knowledge and attitude scores following the intervention ($P < 0.001$). The study concluded that the STP was effective in enhancing adolescents' knowledge and positive attitudes toward the prevention of RTAs.[26]

2.4 Studies related to the incidence of RTAs

Adhyapak et al. (2024) conducted a study titled "Incidence and Pattern of Road Traffic Accidents in Emergency Department of Selected Hospitals." Using an observational survey design, data were

collected from 525 participants across four hospitals. The study found that RTAs were most common among males aged 18–35 years, with fractures being the most frequent injury. Significant associations were observed between RTAs and demographic factors such as age, gender, education, occupation, and risky lifestyle habits. The study concluded that targeted road safety interventions and stricter traffic regulations are essential to reduce RTA-related injuries and deaths.[27]

Dindi et al. (2019), in their study titled "Road Traffic Injuries in India: A Review of Epidemiology, Challenges and Initiatives" reviewed secondary data from national and international sources to assess the burden of road traffic injuries (RTIs) in India. The study found that RTIs are a leading cause of death and disability, particularly among young adults aged 15–29 years. Key contributing factors included unsafe road infrastructure, mixed traffic, alcohol use, and inadequate enforcement of traffic laws. The authors highlighted underreporting of non-fatal injuries and emphasized the need for strengthened road safety measures, improved surveillance systems, effective policy implementation, and better post-crash care to reduce the RTI burden in India.[28]

Chourasia et al. (2020), in their study titled "Epidemiological Study of Road Traffic Accident Cases Attending a Tertiary Care Hospital in South Western India" analyzed 875 RTA cases over three years (2016–2018). The study found that young males aged 21–30 years and two-wheeler riders were the most affected. Accidents were more common during monsoon months, particularly in June, and alcohol was involved in 17.6% of cases. The

authors concluded that most RTAs are preventable and emphasized the need for stricter traffic law enforcement, public awareness, and targeted road safety interventions.[29]

Tushar et al. (2025), in their study titled "Road Traffic Accidents: Global and Indian Trends, Risk Factors, and Prevention Strategies" reviewed data from WHO, NCRB, and published literature (2000–2024). The study reported that RTAs cause approximately 1.35 million deaths annually worldwide, with India contributing approximately 11% of these deaths. Young adults, pedestrians, and two-wheeler riders were identified as the most vulnerable groups. The authors concluded that RTAs are a major public health issue and emphasized strengthening traffic law enforcement, road and vehicle safety, emergency care, and public awareness to reduce accident-related injuries and deaths.[30]

Darivemulaet al. (2023), in their study titled "Pattern and Profile of Road Traffic Accident Victims Attending a Tertiary Care Hospital in India" conducted a retrospective analysis of 397 RTA victims. The study found that most victims were males (77.8%) aged 21–40 years, with motorcycle riders being the most affected. Accidents occurred more frequently during evenings, nights, and weekends, and lower-limb injuries were the most common. The authors concluded that young male two-wheeler riders are at the highest risk of RTAs and emphasized the need for targeted road safety and prevention strategies.[31]

2.5 Studies related to the knowledge regarding RTA

1. The study titled "Knowledge Regarding Road Traffic Accident among Students of Higher Secondary School" by Pooja Gauro and Sangeeta K.C. (2022) assessed RTA knowledge among 80 higher secondary students in Birgunj, Nepal. The study found that 66.3% demonstrated high knowledge and 33.7% had moderate knowledge regarding RTAs. Knowledge was significantly associated with age, vehicle-riding ability, and familiarity with vehicle types. The authors concluded that while students had good awareness, additional health education programs could further improve road safety knowledge and practices.[32]

2. The study titled "Awareness on Road Traffic Accidents among College Students" by Keerthana B., Vishnu Priya V., and Gayathri R. (2021) assessed awareness of Road Traffic Accidents [RTA] among 100 college students in Tamil Nadu, India. Using an online self-structured questionnaire, the study found that 97% of students were aware of RTAs**.** The researchers concluded that regular awareness programs, seminars, and workshops are necessary to improve road safety knowledge and encourage safe driving practices among young adults.[33]

3. The study titled "Factors Associated and Knowledge on Road Traffic Accidents, Rules Among Private University Students in Chengalpattu District, Tamil Nadu, India – A Cross-Sectional Study" by Vijayakrishnan et al. (2022) assessed RTA risk factors and knowledge of traffic rules among 500 medical undergraduates. The study found that 30.4% had experienced an RTA**,** while 75% demonstrated good knowledge of traffic rules. Mobile phone use, drunken driving, over-speeding, and traffic signal violations were significantly associated with RTAs. The authors concluded that despite adequate knowledge, risky driving behaviors increase accident risk, emphasizing the need for focused road safety education.[34]

4. The study titled "Awareness of Road Traffic Accidents and Their Basic Management among Medical Students of Government Medical College, Maharashtra, India" by Srivastava et al. (2019) assessed road safety and basic life support knowledge among 265 medical students. While 94.3% had good knowledge of traffic signs**,** many showed poor safety practices and limited knowledge of emergency management, with only 5.2% aware of correct airway management in RTAs**.** The study concluded that medical students require formal training in road safety and basic life support to improve RTA management and prevention.[35]

2.6 Studies related to the importance of the Golden Hour in RTA

1. The article "Golden Hour in Trauma Care: Why Immediate Medical Attention Saves Lives" by H.P.Ghosh Hospital, Kolkata, published on September 5, 2025 highlights the critical importance of prompt intervention within the first sixty minutes following traumatic injury, known as the "Golden Hour." The article stresses public awareness, first aid knowledge, and quick access to emergency services as vital for survival before professional help arrives. The article states that timely intervention reduces blood loss, prevents complications, stabilizes vital functions, and enhances surgical success. Overall, the study underscores that immediate, coordinated medical care during the Golden Hour is essential for saving lives and improving recovery.[36]

2. The news article from Times of India (2024) "Rising Trends of Road Accident & Trauma Services in North India" reports the insights shared by senior medical professionals in Chandigarh regarding the increasing incidence of road traffic accidents and the importance of timely trauma care. The article emphasizes the Golden Hour concept, the first 60 minutes after an accident, the critical window for stabilizing victims, providing emergency care, and improving survival outcomes, and underscores the urgent need for public awareness about traffic safety, adherence to speed limits, and prompt access to emergency trauma services. The

conclusion stresses that reducing fatalities and severe injuries requires both societal responsibility and effective emergency response systems in the golden hour.[37]

1. The article "The Golden Hour in Trauma Care: Why Every Second Counts" by Dr. Moussa Issa, published on February 14, 2025, explores the critical importance of timely intervention in trauma patients, emphasizing that early care during the first 60 minutes following injury can significantly influence survival and recovery outcomes. The article underscores that rapid recognition, stabilization, and transport within the Golden Hour reduces mortality, prevents the progression of

hypovolemic shock and the lethal triad and minimizes long-term complications. The article also emphasizes that while the strict 60-minute window is flexible, the principle of "every second counts" remains fundamental and ongoing research continues to refine prehospital triage, transport decisions, and trauma system design. The conclusion reinforces that early intervention, coordinated prehospital and hospital response, and evolving trauma technologies collectively enhance survival for critically injured patients, maintaining the Golden Hour as a cornerstone of trauma care practice worldwide.[38]

2. The article by Meridian Hospital (2025) "Golden Hour in Trauma Care: The First 60 Minutes for Saving Lives" emphasizes the critical first 60 minutes following trauma, during which timely intervention can save lives and reduce complications. It provides a descriptive overview of trauma care in India, highlighting road accidents (67.3% of cases), falls, assaults, industrial accidents, and natural disasters as common emergencies. The article also highlights the gaps in public first-aid knowledge and pre-hospital care, stressing the importance of timely hospital intervention. The conclusion reinforces that prompt assessment and resuscitation during the Golden Hour are essential to improve survival and recovery outcomes.[39]

3. The article "Road Accidents in India: The Golden Hour & Resuscitative Hour" by B. V. N. Jayasri and B. Sravani focuses on the critical role of timely trauma management in reducing mortality and complications from road traffic accidents in India. The article demonstrates that the Golden Hour, the first 60 minutes after an accident, is the most crucial period for stabilizing the injured, stopping hemorrhage, managing serious injuries, and ensuring transport to specialized care, significantly improving survival rates and reducing the risk of long-term complications. It emphasizes that the responsibility of leveraging the Golden Hour does not rest solely on emergency services; both drivers and pedestrians must understand its importance and respond appropriately during emergencies. In conclusion, effective trauma management within the Golden Hour, combined with societal awareness and individual responsibility, is essential to minimize mortality, prevent complications, and improve recovery outcomes for road accident victims across India.[40]

2.7 Studies related to the knowledge regarding the Golden Hour in RTA

The study titled "Public Health Perspectives of Events Occurring during the Golden Hour of Road Traffic Accidents" by Lad Mohit, Narayanan Prakash, and Kumar Sumit (2021) assessed awareness of the Golden Hour and pre-hospital care among RTA victims. Conducted among 18 participants at Kasturba Hospital, Manipal, the study found that although most participants had heard of the Golden Hour, they lacked accurate knowledge of its duration and proper pre-hospital care measures. The authors concluded that increasing public awareness of the Golden Hour and early trauma care is essential to improve survival and reduce complications following road traffic accidents.[41]

The study titled "Awareness of Safe Transfers in Ambulance Drivers after Road Traffic Accidents" by Mitali S. Mehta and Amruta G. Ekbote (2023) assessed knowledge and practices related to safe patient transfers among 102 ambulance drivers in Pune, Maharashtra. The study found limited awareness of safe transfer techniques, spinal injury management, and the Golden Hour, with only 10.8% having received first aid training**.** The authors concluded that ambulance drivers require structured education and training programs to improve safe transfer practices and patient outcomes following road traffic accidents.[42]

The study titled "Knowledge, Attitudes, and Practices Regarding First Aid for Road Traffic Accidents Among the Romanian Population" by Alice Beatrice Ifrim and Viviana DenisaMaro (2025**)** assessed first aid knowledge among 400 Romanian adults. The study found that most participants had

medium to low first aid knowledge, while those with formal training performed significantly better. The authors concluded that despite positive attitudes toward first aid, practical knowledge remains inadequate, emphasizing the need for accessible and structured first aid training programs for road traffic accident emergencies.[43]

2.8 Summary

This chapter reviewed the literature related to the effectiveness of the Structured Teaching Program, incidences of Road Traffic Accident, the importance of Golden Hour, and knowledge regarding Road Traffic Accident and the Golden Hour. The review of the literature helped the investigators clarify their understanding of the research problem, identify the research gap, and strengthen the conceptual foundation of the study.

3 Research methodology

3.1 Introduction

A method is a word coined of two Greek elements 'meth' and 'odos'. 'Meth' is an element meaning 'after' and 'odos' means 'a way' and 'ology' means the 'study of'. Hence, a method refers to a systematic way of achieving the desired results.[42]

Research methodology is a systematic and structured framework consisting of processes used to obtain, organize, and analyze data.[45]

This chapter describes the research approach, research design, sampling technique, data collection tools, validity and reliability of the tools, data collection procedure, and data analysis plan adopted to assess the effectiveness of STP on knowledge regarding the Golden Hour in RTA among undergraduate students in selected colleges of Satara District.

3.2 Research approach

Research approach is the overall plan, structure, and strategy used to answer the research question while maintaining the integrity of the study.[19]

Research approach indicates the basic procedure for conducting research. The choice of the appropriate approach depends on the purpose of the study.[19]

The present study aimed to assess the effectiveness of the STP on knowledge regarding the Golden Hour in RTA among undergraduate students in selected colleges of Satara District.

A quantitative research approach was adopted for the present study.

3.3 Research design

The research design is the plan, structure and strategy of investigation of answering the research question, the overall plan or blueprint of the reseach.[45]

Research design is the researcher's overall plan for obtaining answers to the research questions. The present study adopted a pre-experimental one-group pre-test-post-test research design.[19]

3.4 Variables under study

Variables are characteristics or attributes of a person, object, or phenomenon that can assume different values. The variables identified in this study were as follows: [19]

- **Independent variables**

Structured Teaching Program [STP]

- **Dependent variables**

Knowledge regarding the Golden Hour in RTA, as measured using the structured knowledge questionnaire.

3.5 Setting of the study

The study was conducted in two selected colleges in Satara District, Maharashtra:

1. Yashwantrao Chavan Mahavidyalaya, Panchwad
2. Kisan Veer Mahavidyalaya, Wai

3.6 Population

Population refers to the entire group of persons, objects, or measurements that meet the eligibility criteria established by the researcher and share one or more observable characteristics.[19]

Target Population: All undergraduate students studying in selected colleges of Satara District.

Accessible Population: Undergraduate students who were available during the data collection period.

3.7 Sample

A sample is a subset of the population selected in such a way that it represents the characteristics of the population.[19]

The sample for the present study comprised 150 undergraduate students from selected colleges in Satara District.

3.8 Sampling technique

"Sampling is the process of selecting a portion to represent the entire population**".**[45]**-Polit and Hungler**

A subset of the population is called a sample. The sample is chosen to represent the population and is used to make generalizations about the population. If the sample is carefully selected, the researcher can make claims about the population with a certain degree of confidence.[19]

The non-probability, convenience sampling technique was used to select the undergraduate students and assess their knowledge.

3.9 Sample size

In this study, the sample consisted of 150 undergraduate students from two selected colleges.

Table 1. Sample size

NAME OF THE COLLEGES	NUMBER OF SUBJECTS
Yashwantrao Chavan Mahavidyalaya, Panchwad.	50
Kisan Veer Mahavidyalaya, Wai	100

3.10 Schematic presentation

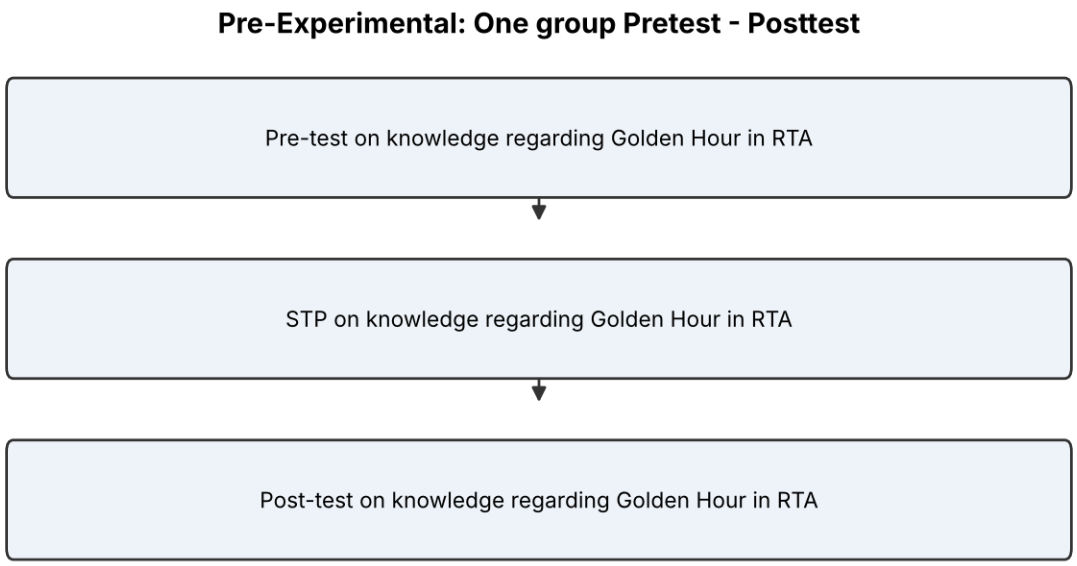


Figure 2. Research design

3.11 Inclusion and exclusion criteria

3.11.1 Inclusion criteria

- Undergraduate students who were willing to participate.
- Undergraduate students who were available during the period of data collection.
- Undergraduate students who were able to understand Marathi or English.

3.11.2 Exclusion criteria

- Student enrolled in medical courses.
- Undergraduate students with intellectual disabilities.

3.12 Tool preparation

The data collection tool translates the research objectives into specific questions, the responses to which provide the data required to achieve the research objectives. In order to achieve this purpose, each question must convey to the respondent the idea or group of ideas required by the research objectives, and each question must obtain a response which can be analyzed to fulfill the research objectives.[19]

The following steps were adopted in the tool preparation:

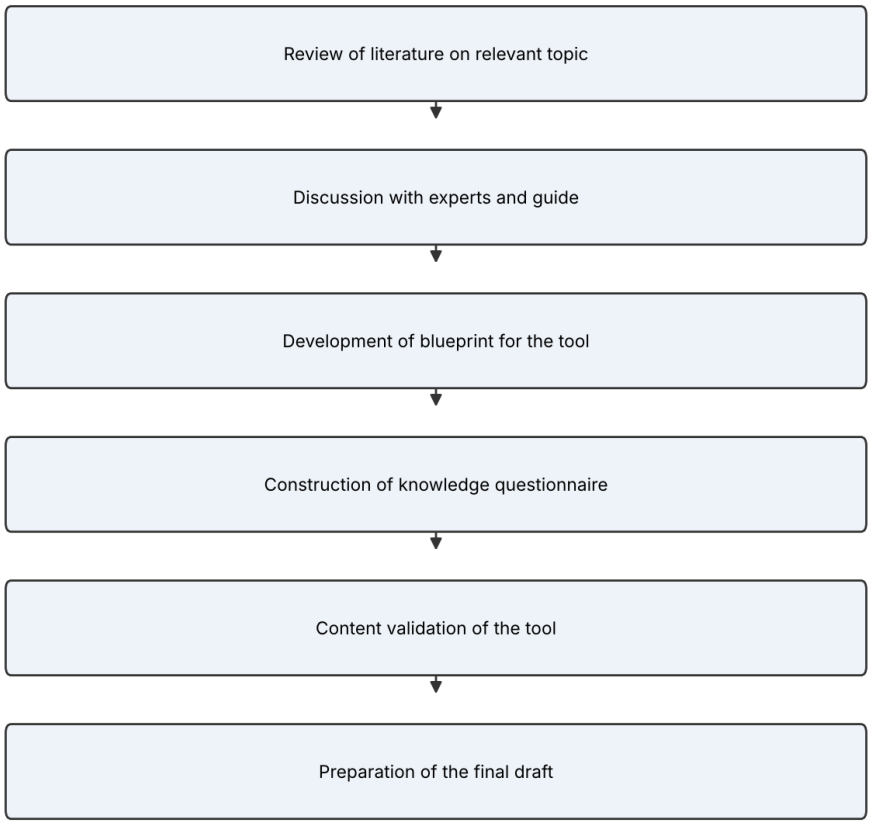


Figure 3. Tool preparation

3.13 Description of data collection tool

In this study, the researchers developed two research tools, Multiple-Choice Questionnaire and STP on the Golden Hour in RTA.

The Multiple-Choice Questionnaire consisted of two subsections**,** Demographic variables and Structured knowledge questionnaire.

The demographic variables included age, gender, witnessing RTA, history of helping victims of RTA, whether any relative works in the medical field.

The structured knowledge questionnaire was used to assess the knowledge regarding the Golden Hour in RTA. The questionnaire consisted of 15 multiple-choice questions. Participants were asked to answer all the MCQs. The questionnaire was based on the knowledge regarding the Golden Hour in RTA. The scoring system consisted of the following rating:

Poor = 0-4 score Average= 5-8 score Good = 9-11 score Excellent= 12-15 score

Each correct answer was rewarded 1 point.

As part of Structured Teaching Program, a 30-minute lesson plan on the Golden Hour in RTA as an intervention was prepared for undergraduate students to improve their knowledge.

The lesson plan consisted of the definition of the Golden Hour and RTA, causes of RTA, common injuries in RTA, importance of Golden Hour and immediate management in the Golden Hour. Audio-visual aids were used such as charts and flashcards to enhance the effectiveness of the teaching.

3.14 Content validity of the tool

Content validity refers to the extent to which the items on a test are fairly representative of the entire domain the test seeks to measure.[19]

Content validity is concerned with the sampling adequacy of the content area being measured. Content validity is of special relevance to individuals designing a test to measure knowledge in a specific content area. The content validity of an instrument is based on judgment. Experts in the content area were called on to analyze the items.[19]

To ensure validity, the tools were submitted to 10 experts from different specialties i.e. Community Health Nursing, Pediatric Nursing, Medical Surgical Nursing, Obstetrics and Gynecology Nursing, and a Statistician and their suggestions and opinions were vital for the final tools.

3.15 Reliability of the tool

The reliability of an instrument that yields quantitative data is a major concern for assessing its quality and adequacy. Essentially the reliability of an instrument is the degree of consistency with which it measures the attribute it is supposed to be measuring. The reliability of the measuring tool can be assessed in several different ways.[19]

- Reliability of the research instruments is defined as the extent to which the instrument yields the same result on repeated measures; it is then concerned with consistency, accuracy, precision, stability, equivalence, and homogeneity.
- Pre-test of the tool was done to find the reliability of the tool
- And the tool was found to be valid with the R ≤1

To assess the reliability of the tool, test-retest method was used and calculated using Pearson's Correlation Coefficient.

$$r = [N \&\#8721; XY \&\#8722; (\&\#8721; X)(\&\#8721; Y)]/ \&\#8730; \{[N \&\#8721; X \&\#178; \&\#8722; (\&\#8721; X) \&\#178;][N \&\#8721; Y \&\#178; \&\#8722; (\&\#8721; Y) \&\#178;]\}$$

r = 0.77

The test-retest reliability coefficient (r = 0.77) indicated that the tool had good reliability and was suitable for data collection.

3.16 Data collection method

The study was conducted from 19/02/2026 to 26/02/2026 (7days), following the time schedule of

09.30 a.m.to 12:30 p.m. The following process was followed for collection of data.

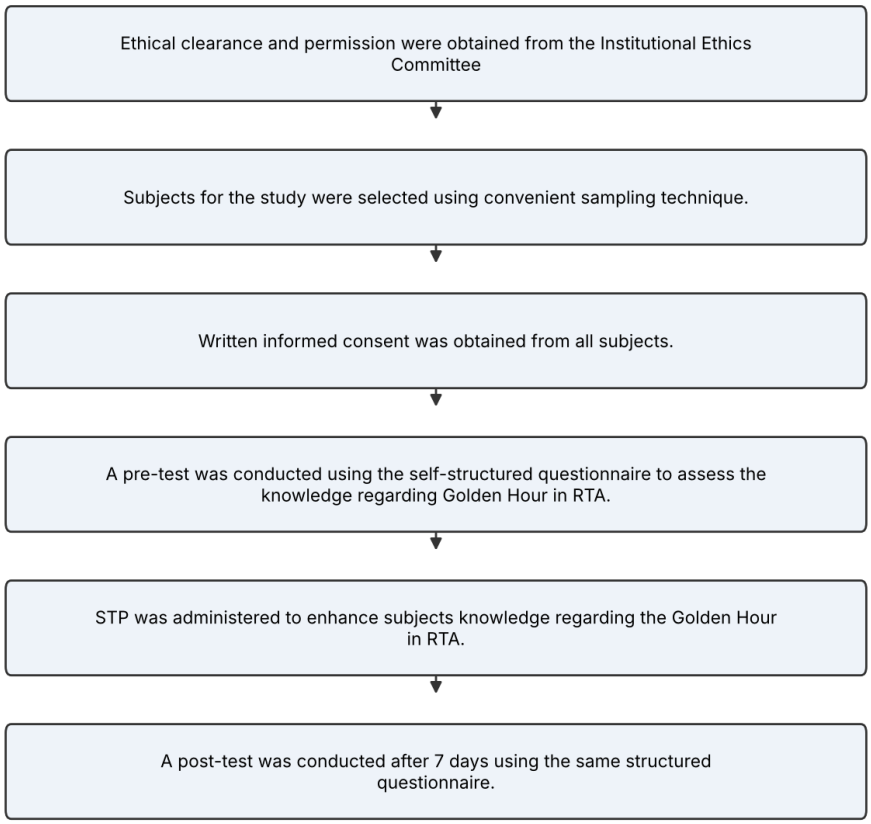


Figure 4. Data collection method

3.17 Plan for data analysis

Data analysis is a process of inspecting, transforming and modeling data with the goal of discovering; and useful for drawing conclusions and supporting decision making. The data obtained was analyzed using both descriptive and inferential statistics based on the objectives and hypotheses of the study under the following: [1]

- Preparation of master data sheet.
- Frequency and percentage distribution of subjects based on their demographic variables.
- Mean and standard deviation for pre-test and post-test scores.
- Paired t-test to determine the effectiveness of STP.
- Chi-square to determine the association between the demographic variables and level of knowledge

3.18 Pilot study

A pilot study is a small-scale version or trial run of the major study. The function of the study is to obtain information and assess the feasibility of the study for improving and to decide the plan for data analysis.[19]

Permission was obtained from the Institutional Ethics Committee for conducting this study. The pilot study was conducted from 11/02/2026 to 17/02/2026, on 15 subjects of Smt. Meenal Ben Mehta, College of Arts, Commerce and Science, Panchgani. The study subjects were informed about the study and informed written consent was obtained from them. Non-probability convenience sampling

technique was used in the collection of samples. Pre-test was conducted by instructing them to choose the correct answer from a questionnaire. Post-test was conducted after 7 days which signified that, there was a significant difference between the pre-test and post-test knowledge scores. The Pilot study also gave an insight into the actual process of data collection and analysis. No problem was faced during the pilot study, so the study was conducted as planned.

3.19 Summary

This chapter has dealt with the methodology adopted for the study and presents the research approach, research design, setting, population, sample and sampling technique, development and validation of the tool, procedure for data collection and data analysis plan. The collected data were analyzed by using descriptive and inferential statistics. This chapter provides the basis for the analysis and interpretation of data.

4 Data analysis and interpretation

4.1 Introduction

Analyzing and interpreting data is a crucial process involving the assessment of collected information to derive meaningful conclusions and implications. The approach to analyzing data can vary depending on the type of data gathered, but it typically revolves around aligning with the objectives and inquiries of the assessment.[46]

4.2 Objectives of the study

1. To assess the pre-test knowledge scores on the Golden Hour in RTA among undergraduate students in selected colleges of Satara District.
2. To assess the post-test knowledge scores on the Golden Hour in RTA among undergraduate students in selected colleges of Satara District.
3. To evaluate the effectiveness of STP on the Golden Hour in RTA among undergraduate students in selected colleges of Satara District.
4. To find the association between socio-demographic variables and pre-test and post-test knowledge scores on the Golden Hour in RTA among undergraduate students in selected colleges of Satara District.

4.3 Organization of study findings

SECTION I: Frequency and distribution of demographic variables.

SECTION II: Analysis of pre-test and post-test knowledge score of subjects on Golden Hour in Road Traffic Accident

SECTION III: Association between demographic variables and knowledge score of undergraduate students in pre-test and post-test.

- **SECTION III A:** Association between age and knowledge score of undergraduate students in pre-test and post-test.
- **SECTION III B:** Association between gender and knowledge score of undergraduate students in pre-test and post-test.

- **SECTION III C:** Association between year of course and knowledge score of undergraduate students in pre-test and post-test.
- **SECTION III D:** Association between course and knowledge score of undergraduate students in pre-test and post-test.
- **SECTION III E:** Association between ever witnessed road traffic accident and knowledge score of undergraduate students in pre-test and post-test.

4.4 Presentation of data

4.4.1 Section I: Frequency and distribution of demographic variables

Table 2. Frequency and distribution of demographic variables (N = 150)

DEMOGRAPHIC VARIABLES		
Demographic variable	**Frequency**	**Percent (%)**
1. Student's Age		
a. 18-20	70	46.67%
b. 21-26	80	53.33%
2. Gender		
a. Male	70	46.67%
b. Female	80	53.33%
3. Course		
a. B.Com	67	44.67%
b. BCA	60	40%
c. BA	23	15.33%
4.Year of course		
a. 1st year	39	26.00%
b. 2nd year	67	44.67%
c. 3rd year	44	29.33%
5. Witnessed/Not-Witnessed [RTA]		
a. Witnessed	114	76%
b. Not-Witnessed	36	24%
6. Helped / Not-Helped Victims [RTA]		
a. Helped	105	70%
b. Not-Helped	45	30%
7. Relatives in the Medical Field		
a. Yes	85	56.67%
b. No	65	43.33%

Percentage distribution of undergraduate students according to their age:

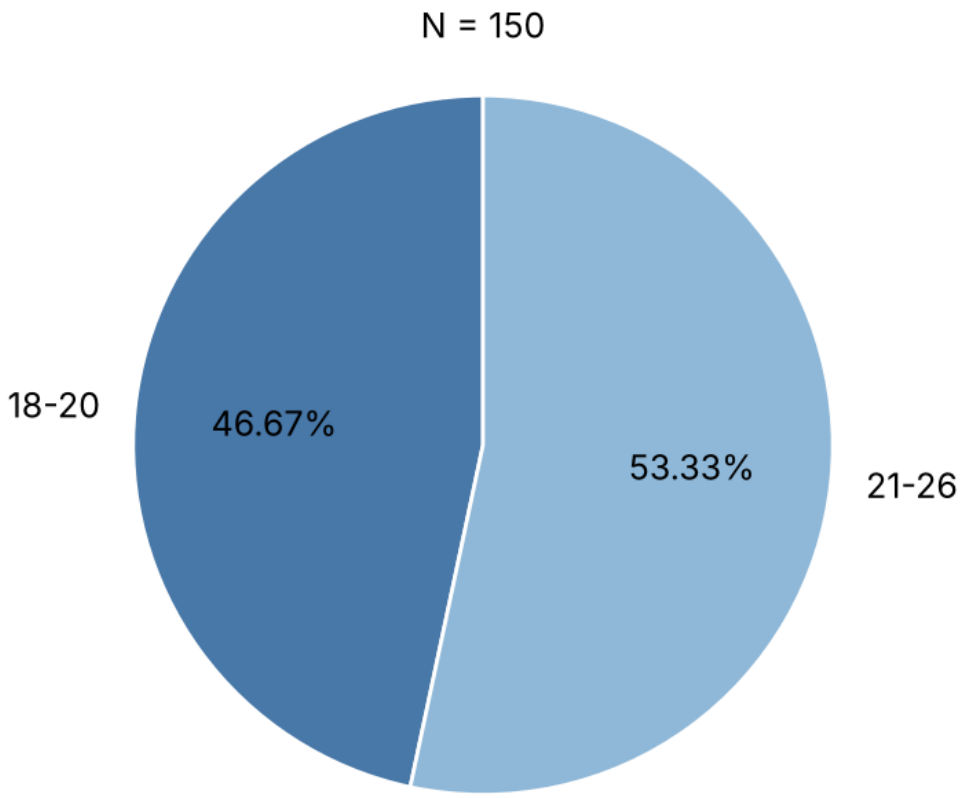


Figure 5. Percentage distribution of undergraduate students according to their age

Percentage distribution of undergraduate students according to their gender:

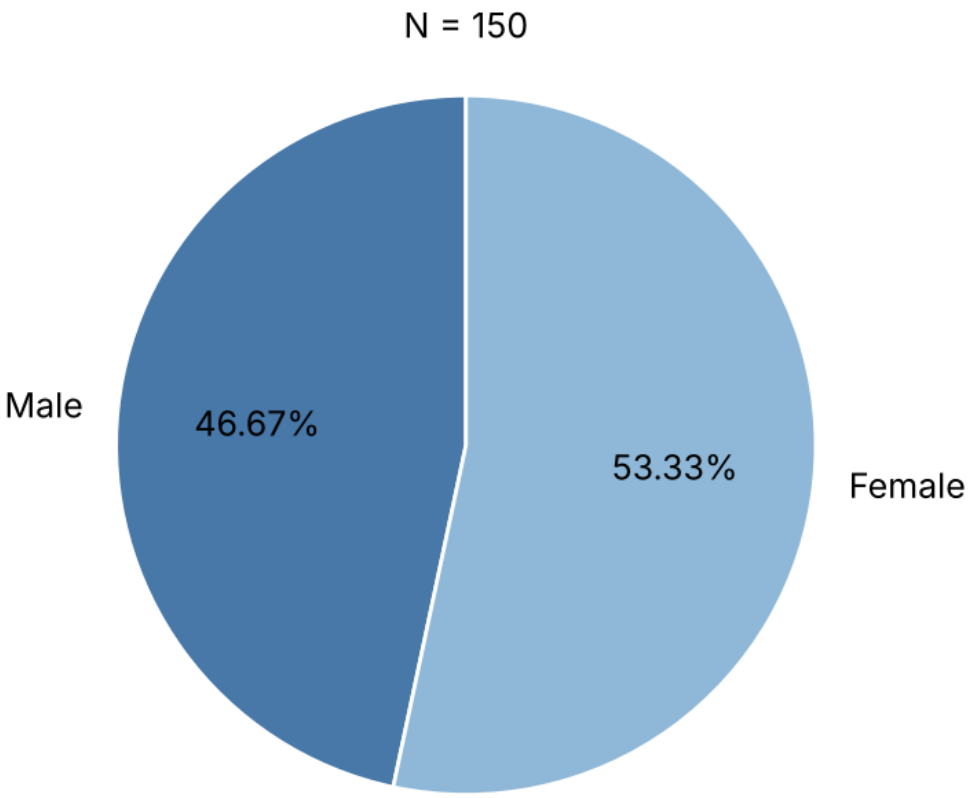


Figure 6. Percentage distribution of undergraduate students according to their gender

Percentage distribution of undergraduate students according to their courses:

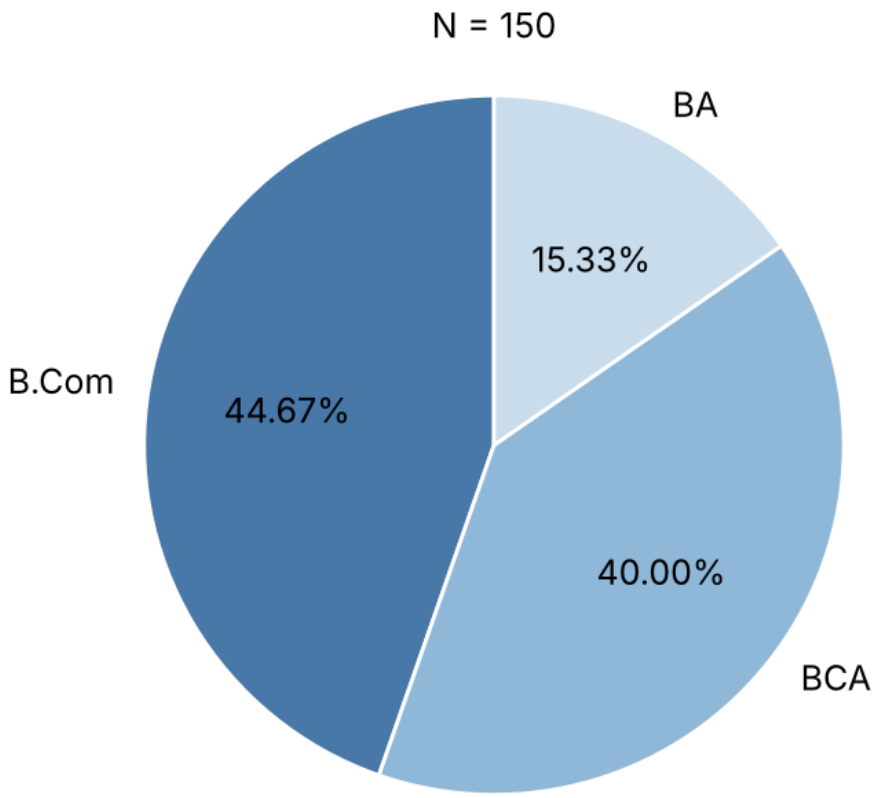


Figure 7. Percentage distribution of undergraduate students according to their course

Percentage distribution of undergraduate students according to their year of course:

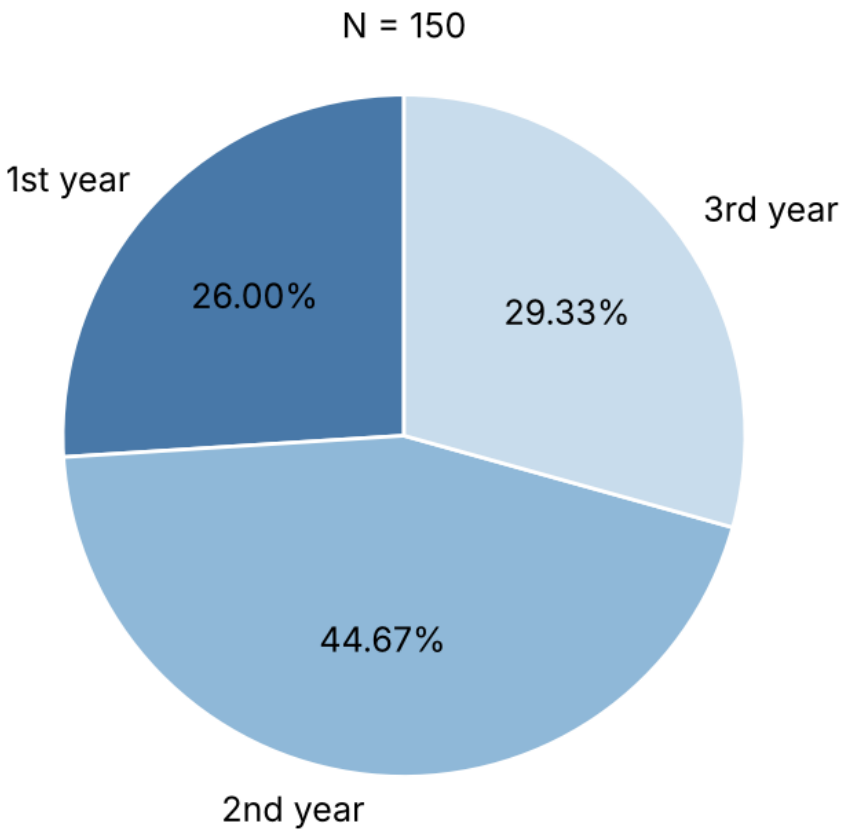


Figure 8. Percentage distribution of undergraduate students according to their year of course

Percentage distribution of undergraduate students witnessing/not-witnessing Road Traffic Accidents:

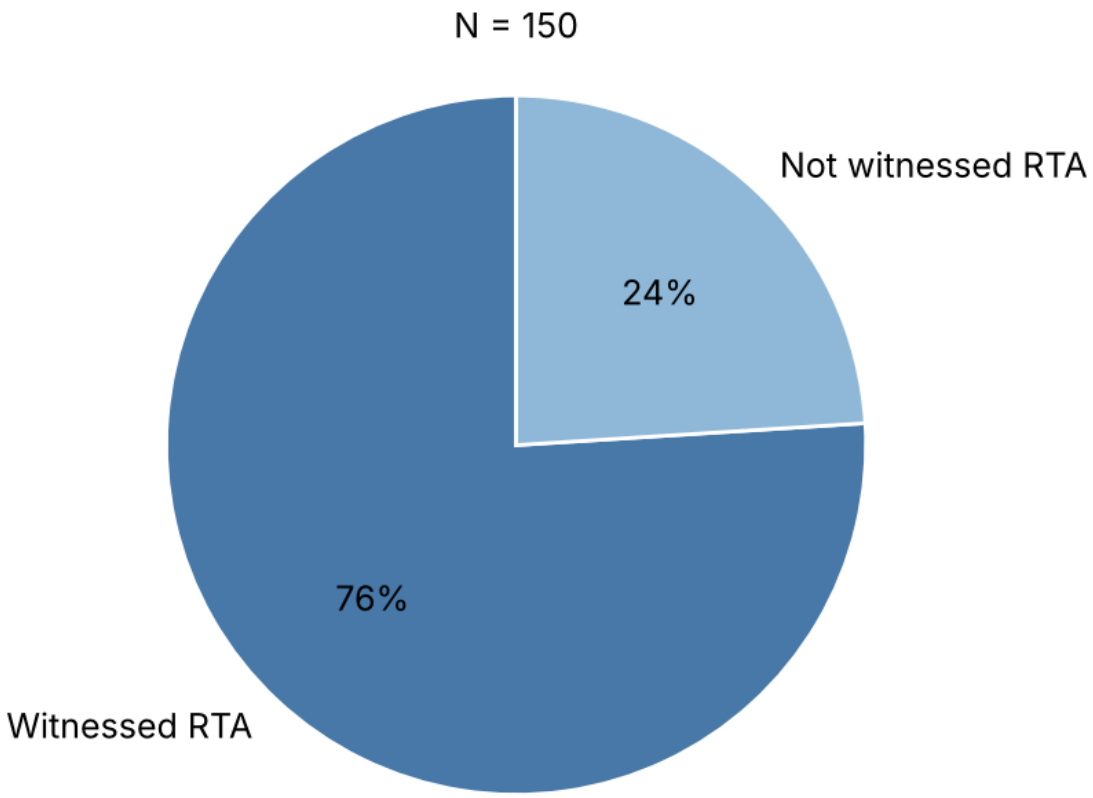


Figure 9. Percentage distribution of undergraduate students witnessing or not witnessing road traffic accidents

Percentage distribution of undergraduate students helped/not-helped victims of Road Traffic Accident:

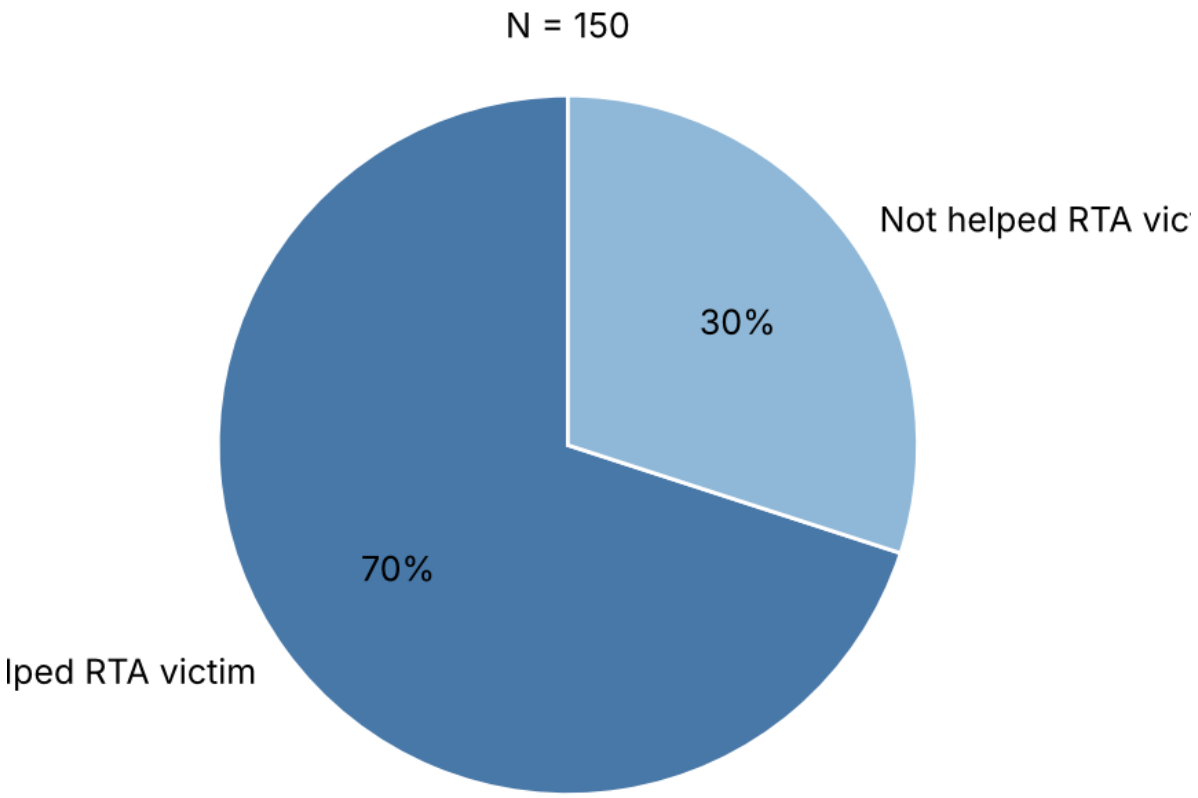


Figure 10. Percentage distribution of undergraduate students who had or had not helped victims of road traffic accidents

Percentage distribution of undergraduate students relatives in the medical field:

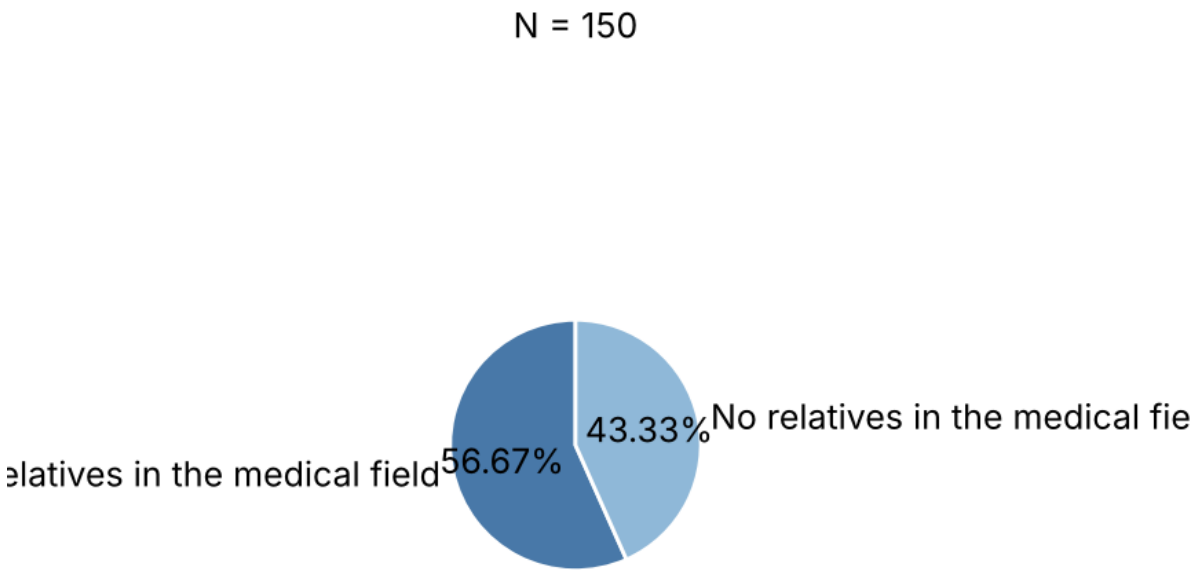


Figure 11. Percentage distribution of undergraduate students with relatives in the medical field

4.4.2 Section II: Analysis of pre-test and post-test knowledge among subjects regarding the Golden Hour in road traffic accidents

Table 3A. Assessment of knowledge level in the pre-test (N = 150)

Level of knowledge	No. of students	Percentage (%)
Poor	37	24.67%
Average	92	61.33%
Good	21	14%
Excellent	0	0%
Total	150	100%

Table 3B. Assessment of knowledge level in the post-test (N = 150)

Level of knowledge	No. of students	Percentage (%)
Poor	6	4%
Average	11	7.33%
Good	10	6.67%
Excellent	123	82%
Total	150	100%

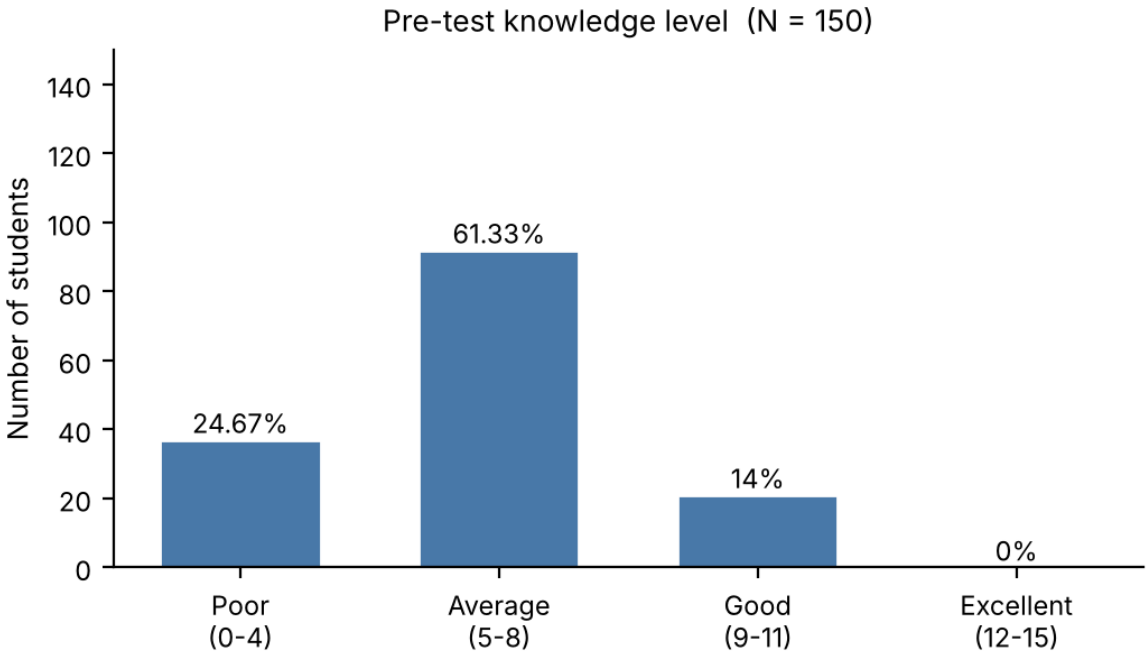


Figure 12A. Pre-test knowledge level of undergraduate students

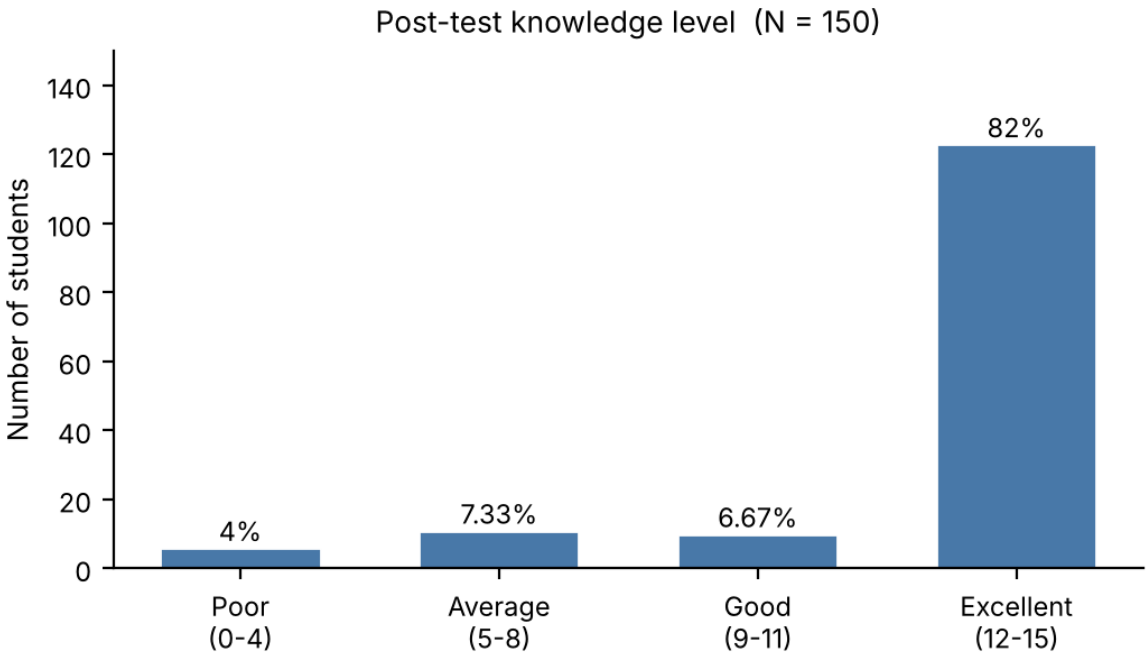


Figure 12B. Post-test knowledge level of undergraduate students

4.4.3 Section III: Association between demographic variables and knowledge score of undergraduate students in the pre-test and post-test

Table 4A. Association between age and knowledge score in the pre-test and post-test (N = 150)

Variable	Level of Knowledge			Chi-square value	p-value
Pre-test		**Post-test**		**Pretest:** 0.7547	**Pretest:** 0.3850
Age	Poor/ Average	Good/ Excellent	Poor/ Average		Good/ Excellent
18-20	57	2	10	59	**Post-test:** 4.201	**Post-test:** 0.404
21-26	72	9	3	78	
Total	150		150		

Table 4 A: Shows that there is no association between the age of the undergraduate students and the level of knowledge.

Table 4B. Association between gender and knowledge score in the pre-test and post-test (N = 150)

Variable	Level of Knowledge			Chi-square value	p-value
Pre-test		**Post-test**		**Pre-test:** 0.008899	**Pre-test:** 0.9248
Gender	Poor/ Average	Good/ Excellent	Poor/ Average		Good/ Excellent
Male	60	10	5	65	**Post-test:** 0.1087	**Post-test:** 0.7417
Female	69	11	8	72	
Total	150		150		

Table 4 B : Shows that there is no association between the gender of the undergraduate students and the level of knowledge regarding the Golden Hour in RTA.

Table 4C. Association between year of course and knowledge score in the pre-test and post-test (N = 150)

Variable	Level of Knowledge			Chi-square value	p-value
Pre-test		**Post-test**		**Pre-test:** 1.197	**Pre-test:** 0.5497
Year of Course	Poor/ Average	Good/ Excellent	Poor/ Average		Good/ Excellent
1 st year	37	4	4	36	**Post-test:** 1.234	**Post-test:** 0.5395
2 nd year	55	11	7	60	
3 rd year	38	5	2	41	
Total	150		150		

Table 4 C: Shows that there is no association between the year of course of the undergraduate students and the level of knowledge.

Table 4D. Association between course and knowledge score in the pre-test and post-test (N = 150)

Variable	Level of Knowledge				Chi-square value	p-value
Pre-test		**Post-test**		**Pre-test:** 2.869	**Pre-test:** 0.0903	
Course	Poor/ Average	Good/ Excellent	Poor/ Average			Good/ Excellent
B.COM	61	6	8	59	**Post-test:** 1.752	**Post-test:** 0.4164
BCA	50	10	4	56		
BA	18	5	1	22		
Total	150		150			

Table 4 D: Shows that there is no association between the course of the undergraduate students and the level of knowledge.

Table 4E. Association between witnessing a road traffic accident and knowledge score in the pre-test and post-test (N = 150)

Variable	Level of Knowledge				Chi-square value	p- value
Pre-test		**Post-test**		**Pre-test:** 0.03583	**Pre-test:** 0.8499	
Witnessed /Not-Witnessed	Poor/ Average	Good/ Excellent	Poor/ Average			Good/ Excellent
Witnessed	100	15	8	107	**Post-test:** 0.0665	**Post-test:** 0.7964
Not-Witnessed	30	5	2	33		
Total	150		150			

Table 4 E: Shows that there is no association between the witnessing Road Traffic Accident of the undergraduate students and the level of knowledge.

Table 4F. Association between helping victims of a road traffic accident and knowledge score in the pre-test and post-test (N = 150)

Variable	Level of Knowledge				Chi-square value	p-value
Pre-test		**Post-test**		**Pre-test:** 0.2926	**Pre-test:** 0.5886	
Helped/Not helped	Poor/ Average	Good/ Excellent	Poor/ Average			Good/ Excellent
Helped	91	13	10	94	**Post-test:** 0.09382	**Post-test:** 0.7594
Not helped	38	8	3	43		
Total	150		150			

Table 4 F: Shows that there is no association between the helping victims of Road Traffic Accident of the undergraduate students and the level of knowledge.

4.4.4 *The results of the study*

Table 5. Effectiveness of the structured teaching program (N = 150)

Level of knowledge		Pre-test	Post-test	Mean Difference	Degree of freedom (d f)	Paired t-value	p value	Inference
Mean	5.96	13.0067	-7.0467	149	28.311	<0.0001	Significant	
Standard deviation	2.216	2.404	-0.188					
Minimum	1.000	4.000	-3.000					
Median	6.000	14.000	-8.000					
Maximum	11.000	15.000	-4.000					

Table 5 : Shows that mean post-test knowledge score (13.01 ± 2.40) was significantly higher than the mean pre-test knowledge score (5.96 ± 2.22). The calculated paired *t*-value was 28.311 with a *p*-value < 0.0001, indicating that the STP was statistically effective in improving participants' knowledge regarding the Golden Hour in Road Traffic Accident.

5 Discussion

5.1 Introduction

Research discussion is defined as the analytical section of a report where researchers interpret the study results, evaluate their meaning, and draw clinical or theoretical inferences.[19]

The interpretation that researchers assign to the results plays a crucial role in shaping the report. The discussion section provides a thoughtful analysis of the findings and discusses their implications for practice and the advancement of knowledge. A research is incomplete unless the study findings are critically discussed and appropriately summarized.

5.2 Aim

To evaluate the effectiveness of the STP in improving knowledge regarding the Golden Hour in RTA among undergraduate students in selected colleges of Satara District.

H0: There will be no significant difference between the pre-test and post-test knowledge scores after the administration of the STP on the Golden Hour among undergraduate students of selected colleges in Satara District.

H1: There will be a significant difference between the pre-test and post-test knowledge scores after the administration of the STP on the Golden Hour among undergraduate students of selected colleges in Satara District.

5.3 Objectives

1. To assess the pre-test knowledge scores on the Golden Hour in RTA among undergraduate students in selected colleges of Satara District.
2. To assess the post-test knowledge scores on the Golden Hour in RTA among undergraduate students in selected colleges of Satara District.

3. To evaluate the effectiveness of STP on the Golden Hour in Road Traffic Accident among undergraduate students in selected colleges of Satara District.

4. To find the association between socio-demographic variables and pre-test and post-test knowledge scores on the Golden Hour in RTA among undergraduate students in selected colleges of Satara District.

5.4 Findings of the study

The findings of the study are presented according to the study objectives.

1. The study showed that 80 (53.33%) subjects belonged to the age group of ≥21 years and 70 (46.67%) belonged to ≤20 years.
2. Of the 150 subjects, 80 (53.33%) were females and 70 (46.67%) were males.
3. Among the 150 subjects, 67 (44.67%) were in B. Com, 60 (40%) in BCA and 23 (15.33%) in BA.
4. Of the 150 subjects, 67 (44.67%) were in 2nd year, 44 (29.33%) in 3rd year and 39 (26.00%) in 1st year.
5. Out of the 150 Subjects, 114 (76%) had witnessed Road Traffic Accident and 105 (70%) had helped victims of Road Traffic Accidents.

To assess the pre-test knowledge scores on Golden Hour in RTA among undergraduate students in selected colleges of Satara District.

⟨SHAPE ⟩The pre-test findings revealed that: Out of the 150 subjects, 37 (24.67%) had poor knowledge and scored between 0-4, 92 (61.33%) had average knowledge and scored between 5-8, 21 (14%) had good knowledge and scored between 9-11 and none of the subject had excellent knowledge.

To assess the post-test knowledge scores on Golden Hour in RTA among undergraduate students in selected colleges of Satara District.

After providing the STP on Golden Hour in RTA, the findings of the post-test showed: Out of the 150 subjects, 6 (4%) had poor knowledge and scored between 0-4, 11 (7.33%) had average knowledge and scored between 5-8, 10 (7%) had good knowledge and scored between 9-11 and 123 (82%) had excellent knowledge and scored between 12-15.

To evaluate the effectiveness of Structured Teaching Program (STP) on Golden Hour in Road Traffic Accident among undergraduate students in selected colleges of Satara District.

The results of this study revealed that there was significant increase in the knowledge score of undergraduate students regarding Golden Hour in Road Traffic Accident. The mean knowledge score of pre-tests [5.96] and of post-test [13.0067] proved that mean post-test

knowledge score (13.01 ± 2.40) was significantly higher than the mean pre-test knowledge score (5.96 ± 2.22). The paired t-value was 28.311 with a p-value < 0.0001.

Therefore, the study showed that STP was highly effective in improving the knowledge on the Golden Hour in RTA among undergraduate students.

The findings of the present study are consistent with the study conducted by Kanniammal C. and Cecilia Vardhini (2016), who reported a significant improvement in knowledge among school children following a Structured Teaching Programme on prevention of Road Traffic Accidents and first aid management. The obtained t-value confirmed the effectiveness of the intervention.[22]

Similarly, a study by Dilshad Rashid and Aisha Akhter (2017) reported that subjects' knowledge increased significantly in the post-test after implementation of STP among adolescents. [23]

Likewise, Sanjata Ganapati Naik and Jaisha Hadlin D'Souza (2023) observed an increase in mean knowledge scores among school children after STP. These studies support the finding of the present study that educational interventions are effective in enhancing knowledge regarding road safety and emergency management.[25]

To find the association between socio-demographic variables and post-test knowledge scores on the Golden Hour in RTA among undergraduate students in selected colleges of Satara District.

The results of the study revealed no statistically significant association between the demographic variables and the level of knowledge of undergraduate students regarding the Golden Hour in Road Traffic Accident.

The findings of the present study are in agreement with the study conducted by Lad Mohit, Narayanan Prakash, and Kumar Sumit (2021), which revealed that although participants had varying backgrounds and experiences, awareness regarding the Golden Hour remained inadequate and required structured educational interventions.[41]

However, the findings of the present study are contrary to those reported by Vijayakrishnan et al. (2022), who found a significant association between knowledge of traffic rules and factors such as age, driving behavior, mobile phone use while driving, drunken driving, and traffic signal violations among university students. Their study suggested that demographic and behavioral factors influenced knowledge and accident occurrence.[34]

5.5 Implications of the study

The findings of the present study have important implications not only in the field of emergency and trauma nursing and critical care nursing practice but also in the field of community health nursing, medical-surgical nursing and forensic nursing. The study also brought out certain facts that have implications for nursing education, nursing administration and research.

5.5.1 Implications for nursing education

1. Nurse educators can use STP as an effective teaching strategy to improve students' knowledge regarding emergency care.
2. Regular seminars, workshops, demonstrations, and simulation-based training can be organized to enhance students' competencies in managing RTA victims.
3. Audio-visual aids and innovative teaching methods can be utilized to improve learning outcomes among students.

5.5.2 Implications for nursing administration

1. Nurse administrators can organize periodic in-service education program and continuing nursing education programmes on trauma and emergency care.
2. Administrators can collaborate with educational institutions and community organizations to conduct road safety awareness campaigns.

5.5.3 Implications for nursing research

1. Similar studies can be conducted on larger samples from different districts and states to improve the generalizability of findings.

2. Comparative studies may be undertaken between rural and urban students with respect to knowledge of the Golden Hour in RTAs.

3. Further studies can compare the effectiveness of e-learning modules, videos, simulation-based teaching, and traditional teaching methods in improving knowledge regarding the Golden Hour management.

5.5.4 *Implications for nursing practice*

1. Nurses working in hospitals and community settings can educate students and the public regarding the importance of the Golden Hour and first aid measures during Road Traffic Accidents.

2. Community health nurses can conduct awareness programmes on road safety and emergency response in schools, colleges, and communities.

3. Nurses can play a crucial role in promoting early intervention and appropriate first-aid measures to reduce morbidity and mortality associated with RTAs.

5.6 Recommendations

The following recommendations are made based on the study:

Similar studies may be conducted using larger sample sizes from different districts and states to improve the generalizability of the findings.

Comparative studies can be conducted between rural and urban undergraduate students regarding knowledge of the Golden Hour in RTAs.

Further studies can be conducted among school students, teachers, drivers, traffic police personnel, and community members.

Periodic awareness and first-aid training programs on the Golden Hour management can be organized in colleges.

E-learning modules, videos, and simulation-based teaching can be compared with traditional STP methods.

5.7 Summary

This chapter presented a brief discussion of the study findings and highlighted that only a limited number of undergraduate students had knowledge regarding 'Golden Hour' in RTA, emphasizing the need to include first-aid training and emergency care in the academic curriculum, and described the implications, recommendations and conclusion of the study.

5.8 Conclusion

The present study "A study to assess the effectiveness of STP on knowledge regarding the Golden Hour in RTA among undergraduate students in selected colleges of Satara District" was conducted with the aim of evaluating the effectiveness of STP on knowledge regarding the Golden Hour in RTA among undergraduate students. The findings of the study revealed that the students had poor to good knowledge during pre-test whereas a significant improvement in knowledge was observed after the implementation of STP. The mean difference between pre-test and post-test scores indicated that STP was effective in enhancing the students' knowledge regarding the Golden Hour in RTA and emergency response measures. The study concluded that educational interventions such as STP are valuable tools for improving awareness and preparedness among students. The study also revealed that the

regular training and awareness programs on road safety and the Golden Hour management should be encouraged to improve outcomes for RTA victims.

The study provided each researcher with valuable experience in conducting research systematically and overcoming the challenges encountered during the research process.

References

[1] https://www.who.int/news-room/fact-sheets/detail/urban-health

[2] https://www.goodreads.com/quotes/937813-on-the-parable-of-the-good-samaritan-i-imagine-that

[3] Road traffic injuries. (n.d.). Who.int. https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries

[4] (N.d.). *Researchgate.net*. https://www.researchgate.net/publication/392856988_Road_Accidents_in_India_The_Gold en_Hour_Resuscitative_Hour

[5] https://www.researchgate.net/publication/260288299_World_Report_on_Road_Traffic_Injury_Prevention/link/00b4953bd0f0d23cf0000000/download?_tp=eyJjb250ZXh0Ijp7ImZpcnN0UGFnZSI6InB1YmxpY2F0aW9uIiwicGFnZSI6InB1YmxpY2F0aW9uIn19

[6] https://www.researchgate.net/publication/383399780_Accidental_study_on_NH-48_Dehu_Road_Pune_-Satara_stretch

[7] https://pubmed.ncbi.nlm.nih.gov/40070642/

[8] https://www.who.int/teams/social-determinants-of-health/safety-and-mobility/decade-of-action-for-road-safety-2021-2030

[9] https://pubmed.ncbi.nlm.nih.gov/40844121/

[10] https://pubmed.ncbi.nlm.nih.gov/20618970/

[11] https://www.hindustantimes.com/cities/mumbai-news/maharashtra-sees-rise-in-road-accidents-for-6th-straight-year-marginal-dip-in-fatalities-in-2025-101770292814912.html

[12] https://www.oxfordlearnersdictionaries.com/definition/english/assess

[13] https://www.oxfordlearnersdictionaries.com/definition/english/effectiveness

[14] https://www.wisdomlib.org/concept/structured-teaching-programme

[15] https://www.merriam-webster.com/dictionary/knowledge

[16] https://www.oxfordlearnersdictionaries.com/definition/american_english/undergraduate

[17] https://www.oxfordlearnersdictionaries.com/definition/english/college

[18] Miles, M. B., & Huberman, A. M. (1994). Qualitative Data Analysis: An Expanded Sourcebook (2nd ed.). *Thousand Oaks*, CA: Sage Publications.

[19] Polit DF, Beck CT. *Nursing Research: Generating and Assessing Evidence for Nursing Practice, 11th edition*. Philadelphia: Walters Kluwer 2021

[20] Bertalanffy LV. *General System Theory: Foundations, Development, Applications*. New York: George Braziller; 1968.

[21] https://www.sciencedirect.com/topics/chemical-engineering/system-theory

[22] Vardhini M, Kanniammal C. *Effectiveness of STP on prevention of road traffic accident and its first aid management among school children at selected school, Chennai*. International journal of scientific research [Internet]. 2016; 5. https://www.worldwidejournals.com/international-journal-of-scientific-research-(IJSR)/article/effectiveness-of-stp-on-prevention-of-road-traffic-accident-and-its-first-aid-management-among-school-children-at-selected-school-chennai/ODEwMw==/?is=1&b1=469&k=118

[23] https://www.researchgate.net/publication/318194389_Effectiveness_of_Structured_Teaching_Programme_on_Knowledge_Regarding_Prevention_of_Road_Traffic_Accidents_Among_Adolescents_13-18years_in_Selected_Schools_of_Baramulla_Kashmir

[24] Shyamlan PR, Kumari R, Kumar R, Bhumij MN. *A study to assess the effectiveness of structured teaching program on knowledge regarding prevention of road traffic accidents among students of selected college at GNSU, Rohtas*. International Journal of Advanced Research in Science, Communication and Technology [Internet]. 2022; 119–32. https://ijarsct.co.in/Paper4573.pdf

[25] Sanjata M, Naik G, Jaisha M, D'souza H, Jaisha D'souza- M. *A study to assess the effectiveness of structured teaching programme on knowledge regarding road safety measures among school going children in selected schools of Udupi* [Internet]. Ijcrt.org. https://ijcrt.org/papers/IJCRT2303715.pdf

[26] Jayavel M, Lisha LM. *Knowledge and attitude regarding prevention of road traffic accidents among adolescents* [Internet]. Innpharmacotherapy.com. http://www.innpharmacotherapy.com/VolumeArticles/FullTextPDF/68_68_5IPPSAJAN201 4New.pdf

[27] Adhyapak S, Jawade P, Katmore P, Waghachvare P, Panchal S, Saygunde O, et al. Incidence and pattern of road traffic accidents in emergency department of selected hospitals. *J Pharm Bioallied Sci [Internet]*. 2025; 17(Suppl 1): S263–5. http://dx.doi.org/10.4103/jpbs.jpbs_122_25

[28] Dindi K, Bachani D, Singhal M, Singh AR. Road traffic injuries: Epidemiology, challenges and initiatives in India. *Natl Med J India [Internet]*. 2019; 32(2):113–7. https://nmji.in/road-traffic-injuries-epidemiology-challenges-and-initiatives-in-india/

[29] Chourasia S, Radhakrishna KV, Rautji R, D. S. Road traffic accidents attending casualty in a tertiary care hospital: a 03-year study from South Western India. Int J Res Med Sci [Internet]. 2019; 7(10):3744. https://www.msjonline.org/index.php/ijrms/article/view/6989

[30] Tushar, Paul D, Rai R. Road Traffic Accidents: A global and Indian perspective on trends, burden, risk factors and preventive strategies. Himal J Community Med Public Health [Internet]. 2025; 06(01):1–2. https://himjournals.com/hjcmph/1459/1474/road-traffic-accidents-a-global-and-indian-perspective-on-trends-burden-risk-factors-and-preventive-strategies-1650/ vehicle safety, emergency services, and public awareness to reduce injuries and deaths.

[31] Darivemula SB, Jabeen SM, Surapaneni SRA, Rastogi SP, Salodi H, Srujana SL, et al. Epidemiological profile of the victims involved in road traffic accidents (RTA) and ICD-10 classification attending an emergency department: A descriptive study. *Indian J Community Med [Internet]*. 2025; 50(2):356–60. http://dx.doi.org/10.4103/ijcm.ijcm_282_23

[32] Gauro P, Sangeeta KC. Knowledge Regarding Road Traffic Accident among Students of Higher Secondary School. Indian J Appl Res [Internet]. 2018;7 Issue 8. https://www.worldwidejournals.com/paripex/article/knowledge-regarding-road-traffic-accident-among-students-of-higher-secondary-school/MTAwMjI=/?is=1

[33] Jrmds.in. https://www.jrmds.in/articles/awareness-on-road-traffic-accidents-among-college-students-61359.html

[34] Vijayakrishnan G, Priyadharshini P, Ramraj B, Anantharaman VV. Factors associated and knowledge on road traffic accidents, rules among private university students in Chengalpattu district, Tamil Nadu, India - A cross-sectional study. *J Educ Health Promot [Internet]*. 2022; 11(1):148. http://dx.doi.org/10.4103/jehp.jehp_1065_21

[35] Lww.com. https://journals.lww.com/chri/fulltext/2019/06040/a_study_on_awareness_of_road_traffic_accidents_and.5.aspx

[36] Golden Hour in trauma care: Why immediate medical attention saves lives [Internet]. HP Ghosh Hospital. 2025. https://hpghoshhospital.com/golden-hour-in-trauma-care-why-immediate-medical-attention-saves-lives/

[37] TNN. Expert stresses on importance of 'golden hour' *[Internet]*. Times of India. 2024. https://timesofindia.indiatimes.com/city/chandigarh/importance-of-golden-hour-in-road-accident-trauma-services-in-north-india/articleshow/106499788.cms

[38] The Golden Hour in trauma care: Why every second counts [Internet]. *Emlearningcentre.com*. https://www.emlearningcentre.com/blog/the-golden-hour-in-trauma-care-why-every-second-counts

[39] Golden Hour in Trauma Care-The first 60 minutes for saving lives [Internet]. Meridian Hospital. 2025. https://meridianhospitals.in/golden-hour-in-trauma-care/

[40] Golden Hour in trauma care: Why immediate medical attention saves lives [Internet]. HP Ghosh Hospital. 2025. https://hpghoshhospital.com/golden-hour-in-trauma-care-why-immediate-medical-attention-saves-lives/

[41] Mohit L, Prakash N, Sumit K. Public health perspectives of events occurring during the Golden Hour of road traffic accidents. *Indian J Public Health Res Dev [Internet]*. 2021;12(2):557–62. https://www.hjuoz.uoz.edu.krd/index.php/ijphrd/article/download/18085/15880

[42] Mehta MS, Ekbote AG. Awareness of safe transfers in ambulance drivers after road traffic accidents. *Int J Community Med Public Health [Internet]*. 2023; 10(11):4350–4. https://www.ijcmph.com/index.php/ijcmph/article/download/11731/7066/54073

[43] Ifrim AB, Maro VD. Knowledge, attitudes, and practices regarding first aid for road traffic accidents among the Romanian population. *Cureus [Internet]*. 2025; 17(11):e97622. https://assets.cureus.com/uploads/original_article/pdf/408707/20251224-200165-75e6ur.pdf

[44] https://mpra.ub.uni-muenchen.de/105149/1/MPRA_paper_105149.pdf

[45] Polit F,Hungler P. Essentials of Nursing Research.4th ed: Philadelphia, Lippincott; p. 91- 93

[46] Slariya M. *Data analysis & interpretation: Key steps, types & precautions* [Internet]. Budding Sociologist:समाजशास्त्रायसमर्पितम्. Budding Sociologist; 2022. https://buddingsociologist.in/analysis-and-interpretation-of-data/

[47] Taylor, D. (2001). The literature review: A few tips on conducting it. *University of Toronto*, Health Sciences Writing Centre