

Awareness of Computed Tomography (CT) Scan among Commercial Motorcycle (Okada) Riders in a Community of South Eastern Nigeria

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Abstract

Original Research Article

Background: Road traffic accidents pose a significant public health concern globally, with motorcycle riders often being disproportionately affected.

Aim: This study investigates the awareness levels of motorcycle riders regarding road traffic accidents and the utilization of computed tomography (CT) scans for injury diagnosis in the South Eastern Nigeria.

Method: This is a descriptive cross-sectional study of commercial motorcycle riders in a community in South Eastern Nigeria. A well-structured questionnaire was used for data collection. The questionnaire was used to gather data on awareness levels, knowledge gaps, and perceptions among motorcycle riders.

Results: Findings reveal a concerning lack of awareness among motorcycle riders regarding the risks associated with road traffic accidents and the importance of timely diagnostic procedures, such as CT scans, in assessing and managing injuries. These knowledge gaps not only compromise the well-being of motorcycle riders but also contribute to the overall burden of preventable injuries and healthcare costs within the region.

Conclusion: The study underscores the need for targeted educational campaigns and policy interventions to enhance safety practices, promote timely medical interventions, and mitigate the impact of road traffic accidents on the health and well-being of motorcycle riders in the region. The study contributed to the development of effective strategies for improving road safety and reducing the incidence of preventable injuries among motorcycle riders.

Keywords: Computed tomography, Awareness, Commercial motorcycle riders, South Eastern Nigeria.

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Introduction

Computed tomography (CT) is an imaging modality that utilizes x-rays and an array of detectors to generate three-dimensional (3-D)

images of the interior of the body through reconstruction and image processing. CT is an invaluable imaging tool in the diagnostic workup of patients presenting with head trauma, stroke,



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brain tumour and epilepsy [1]. Usage of CT has increased drastically over the past two decades in many countries [2]. The rapid increase in the utilization of cross-sectional imaging examinations over the past two decades, combined with the ongoing improvement in the spatial and contrast resolution of these studies, has led to a marked increase in the number of findings detected that are unrelated to the primary objectives of the examination [3].

The introduction of helical CT has created many important advances in detection and characterization of diseases throughout the body. CT scanning is increasingly used both in research and in clinical medicine with improved image quality obtained especially with the newer helical scanners [4, 5, and 6] CT uses x-ray to produce images. Unlike a conventional x-ray, which uses a fixed x-ray tube, a CT scanner uses a motorized x-ray source that rotates around the circular opening of a donut-shaped structure called a gantry. During a CT scan, the patient lies on a bed that slowly moves through the gantry while the x-ray tube rotates around the patient, shooting narrow beams of x-rays through the body. Instead of film, CT scanners use special digital x-ray detectors, which are located directly opposite the x-ray source. As the x-rays leave the patient, they are picked up by the detectors and transmitted to a computer. Each time the x-ray source completes one full rotation, the CT computer uses sophisticated mathematical techniques to construct a two-dimensional image slice of the patient. The thickness of the tissue represented in each image slice can vary depending on the CT machine used, but usually ranges from 1-10 millimetres. When a full slice is completed, the image is stored and the motorized bed is moved forward incrementally into the gantry. The x-ray scanning process is then repeated to produce another image slice. This process continues until the desired number of slices is collected.

According to Radiologyinfo.org, computed tomography as an investigative modality stands out in the following ways: It is painless, non-invasive and accurate. It has the ability to image

bone, soft tissue and blood vessels all at the same time. Unlike conventional x-rays, CT scanning provides very detailed images of many types of tissue as well as the lungs, bones, and blood vessels. CT examinations are fast and simple; in emergency cases, they can reveal internal injuries and bleeding quickly enough to help save lives. CT is less sensitive to patient movement than MRI. CT can be performed if you have an implanted medical device of any kind, unlike MRI. CT imaging provides real-time imaging, making it a good tool for guiding minimally invasive procedures such as needle biopsies and needle aspirations of many areas of the body, particularly the lungs, abdomen, pelvis and bones. A diagnosis determined by CT scanning may eliminate the need for exploratory surgery and surgical biopsy. Most often, CT is employed in staging of tumours and evaluation of incidental findings not demonstratable by x-rays and ultrasound scan. It serves as confirmatory modality for abdomino-pelvic lesions. Radiologists and radiation oncologists often use the CT examination to quickly identify injuries to the lungs, heart and vessels, liver, spleen, kidneys bowel or other internal organs in cases of trauma, guide biopsies and other procedures such as abscess drainages and minimally invasive tumour treatment, plan for and assess the results of surgery, such as organ transplants or gastric bypass, stage, plan and properly administer radiation treatments for tumours as well as monitor response to chemotherapy, measure bone mineral density for the detection of osteoporosis[7].

There are several studies related to commercial motorcyclists and their impact on road traffic injuries in Nigeria with various point of focuses ranging from riders' characteristics and risk factors to the use of psychoactive substances [8, 9, 10, 11, 12, 13, 14, 15, and 16]. However there has been no in-depth study looking at commercial motorcycle drivers' awareness to CT scan and its benefits.

Awareness of CT scans can contribute to better treatment outcomes for motorcycle riders. Increased awareness of CT scans can help

motorcycle riders recognize the importance of seeking medical attention promptly after an accident. Since its introduction in the 1970s, CT has revolutionized diagnostic decision making [17 and 18]. It has resulted in better diagnosis and treatment of cancer, better treatment after injury and major trauma, better treatment of stroke and cardiac conditions [19 and 20]. CT scan awareness among motorcycle riders can also help facilitate better post-accident care. By understanding the significance of CT scans, riders can communicate their knowledge to healthcare providers, ensuring that appropriate diagnostic measures are taken. This awareness can lead to more comprehensive examinations, including CT scans, when necessary, resulting in more comprehensive and effective post-accident care.

The Ifitedunu community, like many other regions, faces a persistent challenge of road traffic accidents, with motorcycle riders frequently accounting for a significant portion of the victims.

Despite this alarming trend, there is a notable lack of awareness among motorcycle riders regarding the risks associated with road traffic accidents and the importance, purpose and availability of timely diagnostic procedures, such as CT scans, in assessing and managing injuries. This lack of awareness leads to the delayed and inadequate treatment of injuries in the community. Therefore, there is an urgent need to investigate the awareness levels and knowledge gaps among motorcycle riders regarding road traffic accidents and the utilization of CT scans for injury diagnosis. By identifying and addressing these knowledge gaps, interventions can be developed to enhance safety practices, promote timely medical interventions, and ultimately mitigate the impact of road traffic accidents on the health and well-being of motorcycle riders in the Ifitedunu community.

Aim of Study

To assess and enhance the level of CT scan awareness among commercial motorcycle riders in Ifitedun community, Anambra state.

Specific objectives of the Study

1. To determine the level of the awareness of CT scan among motorcycle riders in the locality under study.
2. To enhance the knowledge and understanding of motorcycle riders about the purposes and benefits of CT scans in diagnosing injuries.
3. To determine the factors that influence motorcycle rider's awareness of CT scans such as age, education level, experience.
4. To identify common misconceptions and barriers to seeking medical evaluations including CT scans among motorcycle riders.
5. To provide recommendations for promoting CT scan awareness among motorcycle riders and improving their understanding of the procedure.

Significance of Study

1. By increasing the awareness of CT scan among motorcycle riders, this study can contribute to promoting road safety.
2. Enhancing CT scan awareness among motorcycle riders can result to more informed healthcare decisions. As riders are made aware of the benefits of CT scan, they are more likely to seek prompt medical evaluation after accidents.
3. This will lead to prompt and accurate diagnosis of injuries leading to improved injury management practices, ultimately leading to better recovery outcomes for riders.
4. This study can also provide valuable insights for public health initiatives targeting motorcycle riders.

Scope of Study

This is a cross sectional prospective study. The population sample therefore cuts across the motorcycle riders in Ifitedun community, Anambra state, Nigeria.

2. Materials and Methods

Research Design is a descriptive cross-sectional study of commercial motorcycle riders in Ifitedunu community, Anambra State.

Study Area

The target populations for this study comprises commercial motorcycle riders within Ifitedunu community, Anambra State.

Sample Size

Yaro Yamane formula was used in calculating the sample size

$$n = N / 1 + N(e)^2$$

Where: n= sample size

N= Target population, e= Standard error =0.05

$$n = 100 / 1 + 100(0.0025)$$

$$n = 100 / 1.25$$

$$n = 80$$

Sampling Technique

A convenient sampling technique was used. Where questionnaires were given to those willing to participate.

Instrument for Data Collection

A structured questionnaire was used for data collection. The questionnaire is written in English and in line with the objective of the study. It included open-ended question to gather qualitative insights into participants' perceptions and closed-ended questions to quantify responses. The questionnaire was designed to be clear and concise.

The questionnaire is divided into 5 sections: Sections ABCDE

Section A containing questions on demographic data of respondents. Section B contained questions aimed at assessing participant's motorcycle riding experience. Section C contained questions aimed at assessing respondents' knowledge of CT examinations. Section D was aimed at assessing factors that can motivate respondent to undergo CT scan and the last section assessed respondent's opinion on awareness enhancement.

Procedure for Data Collection

Data was collected using questionnaire designed to elicit information assessing the level of awareness of CT scan among commercial motorcycle riders. Before mass printing, the questionnaire was presented to the research supervisor who approved it. The data collection was made in a way that the questionnaires were explained to those who couldn't fill them. Any question that is unclear was explained so as to ensure correct answering of the question.

Inclusion criteria

1. Commercial motorcycle riders only
2. All commercial motorcycle riders willing to cooperate

Exclusion criteria

1. Non-commercial motorcyclists
2. Motorcycle riders not residing in Ifitedunu community
3. Motorcycle riders that were not willing to cooperate

Ethical Considerations

Ethical approval was obtained from Nnamdi Azikiwe University Teaching Hospital, Ethical committee.

Data Analysis

The data was analyzed using Statistical Package for Social Sciences SPSS Version 21. Data was presented as descriptive statistics such as frequencies, tables and percentages.

3. Results;

Data Presentation

The table and figures that follow are results of the research. The data are presented in line with the sequence of the objectives.

Table 1: Level of the awareness of CT scan among motorcycle riders

Frequency			Percent	Valid Percent
Valid	Yes	19	24.4	24.4
	No	46	59.0	59.0
	Maybe	13	16.7	16.7
	Total	78	100.0	100.0

From the table 1 above only 19 motorcycle riders (24.4%) out of the 78 riders interviewed are sure they have heard of CT scans before now. 13 (16.7%) motorcycle riders feel they might have heard about it while 46 of them (59%) which is more than half of the interviewed subjects have never heard about CT scans before.

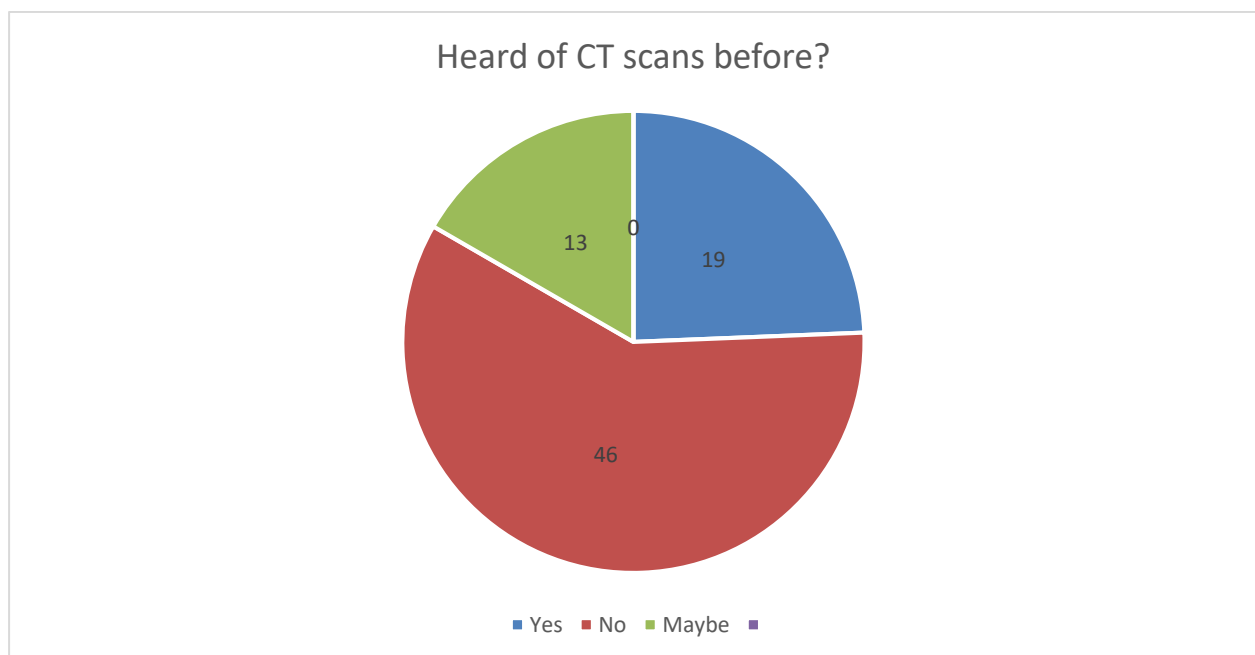
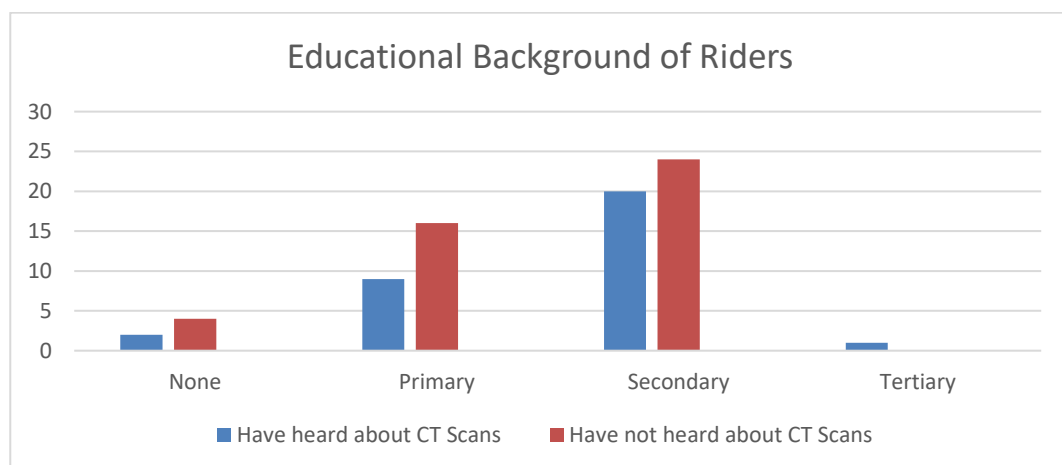


Fig 1: Level of the awareness of CT scan among motorcycle riders

Table 2: The factors that influence motorcycle rider's awareness of ct scan**Heard about CT scans before?****Yes****NO**

		Frequency	Percentage (%)	Frequency	Percentage (%)
Age	20 – 30	9	28.1	4	8.7
	31 – 40	16	50	35	76.1
	41 – 50	6	18.8	7	15.2
	51 above	1	3.1	0	0
Educational Background	None	2	6.3	6	13
	Primary	9	28.1	16	34.8
	Secondary	20	62.5	24	52.2
	Tertiary	1	3.1	0	0
How long have you been riding motorcycles	1-3 years	12	37.5	19	41.3
	4-6 years	14	43.8	21	45.7
	7 years and above	4	12.5	4	8.7
	Less than 1 year	2	6.3	2	4.3

**Fig. 2: Educational background of riders**

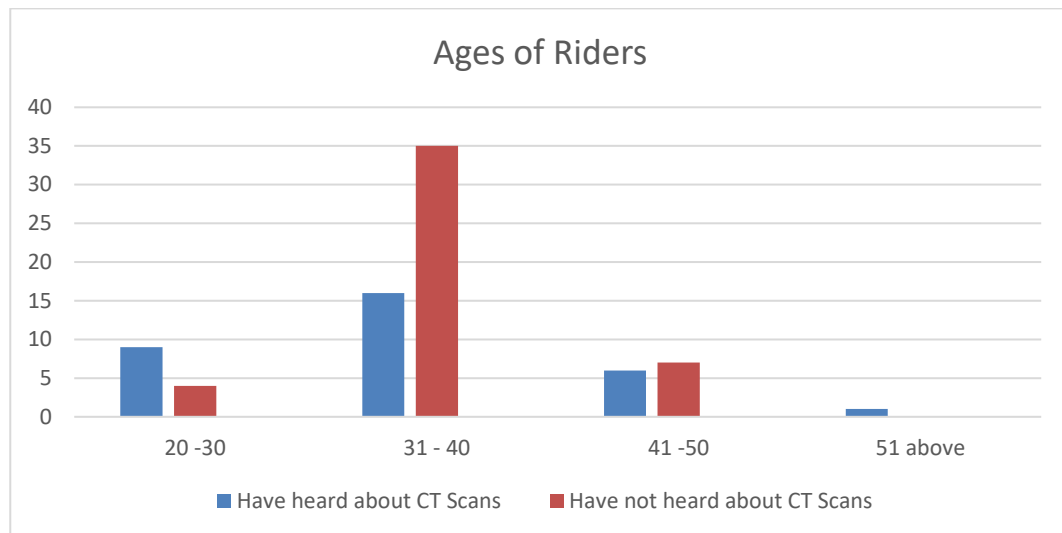


Fig. 3: Ages of riders

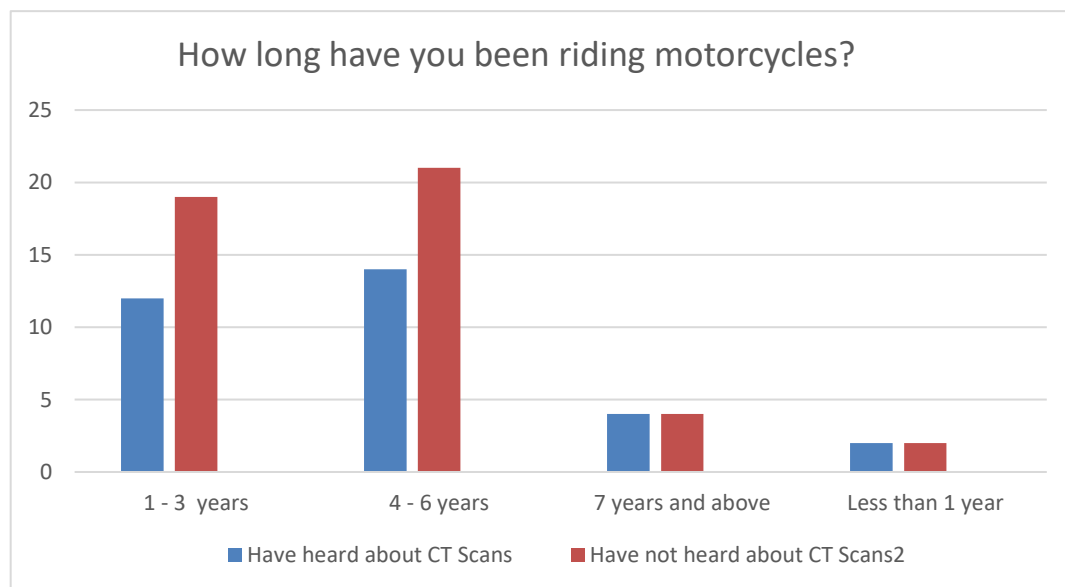


Fig. 4: Riding experience

The table and figures above show the Ages, Educational Background, and level of experience of motorcycle riders that have and have not heard about CT scans. Out of the 32 motorists that have heard about CT scans the age group 51 and above had the lowest frequency (3.1%). The age group 31 to 40 had the highest frequency (50%), the age group 20 to 30 had a frequency of (28%) while the age group 41 to 50 had a frequency of 18%. 2 of them (6.3%) have no educational background 9 of them (28.1%) have primary education 20(62.5%) of them have

secondary school level educational while one of them (3.1%) had tertiary education. 12 of them (37.5%) had 1 to 3 years of motorcycling experience, 14 of them (43.8) had 4-6 years and 4 of them (12.5%) had above 7 years while 2 of them (6.3%) have below a year of experience

Majority of motorists that have heard about CT scans are ages 31-40, stopped at secondary school level of education and have 4 to 6 years of experience.

Table 3: Where have you obtained information about CT scan?

	Frequency	Percentage%
Healthcare professionals.	12	37.5%
Internet sources	8	25%
Friends or family.	3	9.4%
Media (Tv, radio, newspaper).	9	28.1%
Others	Nil	Nil
Total	100.	100%

Table 3 shows that out of the 32 motorcycle riders that have heard about CT scans, 12 (37.5%) obtained information about CT scans from hospital ie. they heard about CT scans from healthcare professionals following physician

referral after a motorcycle accident, 9 (28.1%) heard about CT scan from media such as Tv shows and radio, 3 (9.4%) had heard about CT from friends, 8 (25%) heard about CT scan from the interne

Table 4. Common barriers to taking CT scan examination

	Frequency	Percent	Valid Percent
Cost of scan	20	25.6	25.6
fear of radiation	3	3.8	3.8
fear of radiation and Cost of scan	1	1.3	1.3
Lack of awareness	15	19.2	19.2
Lack of awareness and Cost of scan	1	1.3	1.3
Unavailability of CT scan centers in the community	9	11.5	11.5
Lack of awareness, Lack of physician referral and Cost of scan	1	1.3	1.3
Lack of physician referral	27	34.6	34.6
Lack of physician referral and Cost of scan	1	1.3	1.3
Total	78	100.0	100.0

Table 4 above shows that out of the 78 motorcycle riders interviewed 20 (25.6%) of them reported high cost of the CT scan 3 (3.8%) of them reported fear of radiation 15 (19.2%) of them reported lack of awareness of the purpose of CT scan, 10 (11.5%) reported of unavailability

of CT scan centers in the community and 27 (34.6) of them reported a lack of Physician referral. Some other people reported more than one barrier, for better perception refer to the table above.

Table 5: What do you feel about CT SCAN?

	Frequency.	Percentage%
A bad thing.	Nil.	Nil
A good thing.	31	39.7%
Beneficial.	38	48.7%
Harmful.	5	6.4%
Not acceptable to me	4	5.2%
Total.	78.	100%

Table 5 above shows how respondents feel about CT scan examination, the results that followed showed that 31 (39.7%) of those that have heard of CT scan feels that it is a good thing 38

(48.7%) feels it is beneficial, 5 (6.4%) feels it is harmful and 4 (5.2%) responded that it is not acceptable to them. None of them feels it is a bad thing.

To provide recommendations for promoting CT scan awareness among motorcycle riders and improving their understanding of the procedure.

The Following are means of promoting awareness and understanding of CT scans as suggested by the subjects

- Free medical outreach programs
- Sharing of illustrative/pictorial flyers as well as sensitization campaigns by health workers
- By radio and television broadcast about the importance of CT scan
- Awareness in local languages
- Hospitals should hand educative pamphlets or flyers on CT scans
- Inviting medical practitioners to our union meetings to talk about CT scan

4. Discussion

The discussion of findings was done in order to explain the implications of the results obtained through the questionnaire.

Out of the 78 riders interviewed only 19 motorcycle riders (24.4%) are sure they have heard of CT scans before now. 13 (16.7%) motorcycle riders feel they might have heard about it as they didn't know what CT scan is, while 46 of them (59%) which is majority of the respondents have not heard of CT scans before.

Factors influencing ct scan awareness among motorcycle riders in Ifitedunu community

The age distribution of the respondents showed that the age group most represented were 31-40 with the frequency of 51 out of the 78 participants and 65.4%. This shows that most motorcycle riders fell under this age group and are mostly represented. The least number of participants fell under the age group of 51 and above with frequency of just one person (1.3%).

The study findings indicate that age plays no significant role in influencing CT scan awareness among motorcycle riders in the Ifitedun community. Motorcycle riders in age group of 51 above were poorly represented and thus had a frequency of 1 (3.1%) thereby demonstrating low levels of awareness regarding the importance of CT scans in diagnosing

injuries sustained from road traffic accidents. The age group of 31-40 had highest awareness level of frequency 16 (50%), followed by age group of 20-30 with frequency of 9 (28.1%) and age group 41-50 with frequency of 6 (18.8).

According to this research educational level played a major role in creating a level of awareness of CT scan among motorcycle riders. In Nigeria over 90% of commercial motorcyclists are not formally educated and do not have the required license to ride, which contributes significantly to the high incidence of traffic injuries among them [9, 11, and 10]. However, in this study a greater percentage 89.7% had passed through formal education and training as only 8 (10.3%) had not received and formal education.

Majority of the motorcycle riders 20(62.5%) have heard of CT scans stopped at secondary school level of education, 9(28.1%) had stopped at primary school level of education, 1 (3.1%) stopped at tertiary Level and 2 (6.3%) had no educational background. With most attributing the source of information about CT scans to healthcare professionals, media such as Tv and internet sources. Motorcyclists with riding experience of 4-6 years had a higher level of CT scan awareness with a frequency of 14 participants while those with riding experience of less than a year had the lowest level of CT scan awareness with frequency of 2 people (6.3%). This may be attributed to the cumulative exposure to road traffic accidents and firsthand experiences with injury risks among experienced riders.

The research also pointed out some diagnostic centers listed by the participants that offer CT scan such as Iyien Mission hospital located at Ogidi which takes about 30 mins to get to with no traffic jam, St Charles Borromeo hospital at Onitsha which takes about less than an hour, Amaku teaching hospital at Awka which takes about less than an hour to get to with no traffic jam.

Sources of information about CT scan

Out of the 32 motorcycle riders that have heard about CT scans, majority 12 (37.5%) obtained

information about CT scans from hospital ie. they heard about CT scans from healthcare professionals following physician referral after a motorcycle accident, 9 (28.1%) heard about CT scan from media such as Tv shows and radio, 3 (9.4%) had heard about CT from friends, 8 (25%) heard about CT scan from the internet.

Common barriers to taking CT scan examination

Out of the 78 motorcycle riders interviewed 20 (25.6%) of them reported high cost of the CT scan, 3 (3.8%) of them reported fear of radiation, 15 (19.2%) of them reported lack of awareness of the purpose of CT scan, 9 (11.5%) reported of unavailability of CT scan centers in the community and 27 (34.6) of them reported a lack of Physician referral. This agrees with the study done by [10] which states that effective management of motorcycle related road accident victims is hampered by factors such as unavailability of essential diagnostic equipment such as computed tomography (CT) scan machines in many hospitals, inadequate number of skilled professionals

What do you feel about CT scan?

On how respondents feel about CT scan examination, the results that followed showed that 31 (39.7%) of those that have heard of CT scan feels that it is a good thing 38 (48.7%) feels it is beneficial, 5 (6.4%) feels it is harmful and 4 (5.2%) responded that it is not acceptable to them. None of them feels it is a bad thing.

Summary of Findings

One of the key findings of the study was the pervasive lack of awareness among motorcycle riders about the role of computed tomography (CT) scans in diagnosing injuries sustained from road traffic accidents. Only 19 motorcycle riders (24.4%) Out of the 78 riders interviewed are sure they have heard of CT scans before now, 13 (16.7%) motorcycle riders feel they might have heard about it while 46 of them (59%) which is majority of the the interviewed participants have

not heard of CT scan before.

Despite the potential life-saving benefits of early detection and treatment facilitated by CT scans, a notable proportion of respondents exhibited misconceptions or limited knowledge about the availability and accessibility of CT scan services in the community.

Factors such as cost concerns and lack of awareness of the purpose of CT scan were cited as barriers to seeking timely medical care and undergoing diagnostic imaging procedures

The study findings also highlight the role of education level in shaping CT scan awareness among motorcycle riders. Respondents with secondary level of education 20 (62.5%) demonstrated a more comprehensive understanding of the role of CT scans in injury diagnosis and healthcare management. This may be attributed to increased access to information, critical thinking skills, and health literacy among individuals with higher educational attainment.

In contrast, motorcycle riders no education background 2 (6.3%) exhibited lower levels of CT scan awareness. These riders may face barriers to accessing health information and understanding complex medical concepts, leading to misconceptions or limited awareness regarding the benefits of CT scans in diagnosing injuries.

Furthermore, the findings suggest that motorcycle experience plays a role in influencing CT scan awareness among riders. Experienced riders with 4-6 years demonstrated higher levels of CT scan awareness (43.8%) compared to novice riders. This may be attributed to the cumulative exposure to road traffic accidents and firsthand experiences with injury risks among experienced riders, leading to a heightened awareness of the importance of diagnostic imaging in injury management.

The research also pointed out some diagnostic centers listed by the participants that offer CT scan such as Iyien Mission hospital takes about 30 mins to get to with no traffic jam, St Charles Borromeo hospital which takes about less than an hour, Amaku teaching hospital which takes about less than an hour to get to with no traffic jam.

Conclusion

This study revealed that motorcycle riders in Ifitedunu community, Anambra State have a low level of awareness and poor understanding of CT scan. Very few knew what a CT scan is and its uses in diagnosis of internal injuries.

Underutilization of CT scan after road traffic accident were mostly because of lack of physician referral, cost of scan, fear of radiation and lack of awareness of the benefits of CT scan. These study findings may serve as a useful source of information for researchers and this involved in public health programs.

Recommendations for Promoting CT scan Awareness among Motorcycle Riders

Educational campaigns and training programs aimed at increasing awareness among motorcycle riders in the Ifitedunu community about the risks of road traffic accidents and the importance of CT scans for injury diagnosis should be implemented.

Establish community outreach programs to actively engage motorcycle riders and other stakeholders in discussions about road safety and healthcare awareness.

Improve access to healthcare facilities equipped with CT scan technology in the Ifitedunu community. Advocate for the establishment of mobile medical clinics or telemedicine services to ensure that motorcycle riders have timely access to diagnostic services, particularly in remote or underserved areas where healthcare infrastructure may be limited.

Advocate for the implementation of policies and regulations aimed at promoting road safety and enhancing healthcare access for motorcycle riders. This may include enforcing helmet laws, promoting mandatory safety training for riders, and incentivizing the adoption of safety gear and equipment

Government funding to support comprehensive awareness campaigns specifically targeting motorcycle riders in the Ifitedunu community.

Limitations of the Study

The major limiting factor was the respondent's unwillingness to participate in the study due to mistrust, their busy work environment, concerns about privacy, or reluctance to disclose personal information.

Another limiting factor was the issue of illiteracy as some of them were not able to read. Therefore an interpretation method was adopted which made the work very tedious and stressful.

Declaration

Ethical consideration

The study was approved by the Human research Ethics Committee of Faculty of Health Sciences and Technology, Nnamdi Azikiwe University, Nnewi, Anambra State in line with Helsinki declaration for ethical approval.

The confidentiality of information was ensured by omission of subject's name from data collected.

Data availability: Available on reasonable request from the corresponding author, Ugwuanyi D.C, Email dc.ugwuanyi@unizik.edu.ng

Conflict of interest:

The authors declared no conflict of interest.

Funding: Not applicable.

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