Road Safety Officers' Perceptions of Awareness and Compliance to Safety Measures among Oil and Gas Tanker Drivers in North-Central Nigeria: Implications for Sustainable Development Goals

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Abstract

Background: Nigeria faces a significant road safety issue, particularly in the oil and gas industry, where tanker trucks are frequently involved in road traffic accidents (RTAs), leading to fatalities and severe injuries. Road signs are essential for promoting safety; however, neglecting them has contributed to increased RTAs in North-central Nigeria, exacerbating challenges related to sustainable development goals (SDGs).

Objectives of the study: This study investigates the awareness and compliance levels of oil and gas tanker drivers towards road signs, explores approaches to enhance intrapersonal behaviour, evaluates the effectiveness of Federal Road Safety Corp (FRSC) Officer's awareness methods, and identifies perceived barriers to road sign compliance by oil and gas tanker drivers.

Methodology: FRSC officers participated in this study, and interviews were conducted. Thematic analysis was employed to analyse the data collected from the interviews.

Results: The study reveals that oil and gas tanker drivers in the North-central region have increased awareness but lack compliance, affecting SDGs 4 (Quality Education) and 3 (Good Health and Well-being). Educational challenges, limited training programmes, and illiteracy are barriers to compliance.

Unique Contribution: The study explores the intricate link between educational challenges, road safety compliance, and SDGs, offering a foundation for targeted interventions and policies to improve road safety.

Conclusion: Due to illiteracy and educational deficiencies, Nigeria's oil and gas tanker drivers face challenges in complying with road signs. Training efforts have not fully addressed these issues, and barriers like illiteracy and union influence persist.

Key Recommendation: To align with SDGs 3 and 11 (Sustainable Cities and Communities), the recommendations include enhancing road sign comprehension, revising training, expanding outreach, collaborating with unions, strengthening awareness, and preventing union exploitation among oil and gas tanker drivers.

Keywords: Awareness; Compliance; Oil and Gas Tanker Drivers; Road Safety; Sustainable Development Goals

Introduction

The oil and gas sector's heavy reliance on tankers for upstream and downstream activities has exacerbated road safety issues, making them a significant public concern (Moiseev, 2021). Tankers, crucial for transporting large quantities of oil and gas, especially in rural and urban regions of Nigeria, have led to a surge in reported accidents, particularly in the northern region, resulting in numerous fatalities and severe injuries due to inadequate compliance with road signs, particularly in the northern region (Mustapha et al., 2022).

Road signs are essential traffic control devices that guide drivers by providing critical information, instructions, and warnings to ensure safe navigation. Their effectiveness lies in their ability to communicate, regulate, warn, and guide road users, facilitating smooth traffic flow and reducing accidents (Idris & Mustapha, 2019). Despite the importance of road signs, negligence towards them contributes to the increasing rate of road traffic accidents (RTAs) globally. In Nigeria, RTAs have a significant impact, with poor road infrastructure, non-compliance with safety devices, and a lack of awareness about road signs exacerbating the issue (Akuirene et al., 2020). The substantial percentage of crash-related deaths involving tankers underscores the urgency of addressing this problem through improved road sign awareness and compliance. The limited literature on traffic signs in Nigeria concerning tanker drivers' knowledge and compliance highlights the need for targeted research to improve road safety and reduce traffic fatalities. Understanding the challenges faced by this group is crucial for developing effective interventions and policies that align with the Sustainable Development Goals (SDGs).

Improving road safety for Nigeria's oil and gas tanker drivers supports several SDGs. It aligns with Goal 3 by enhancing road safety to reduce fatalities and injuries and Goal 4 by offering literacy programs and training to improve compliance with road signs. It supports Goal 9 through resilient infrastructure and sustainable transportation and Goal 10 by addressing disparities in education and training. Goal 11 is addressed by promoting road safety for safe communities. Goal 17 is supported by collaboration with the government, stakeholders, and the private sector to mobilise resources and achieve these SDGs.

This study examines road safety from the perspective of enforcement officers, focusing on the awareness and compliance levels among oil and gas tanker drivers in North-Central Nigeria. It identifies gaps in current safety measures and enforcement practices, aiming to reduce accidents, save lives, and lower healthcare costs. The findings will inform policymakers and industry leaders, promoting safer roads and sustainable development. This will save lives and support Nigeria's broader development goals, promoting safer transportation practices and sustainable growth within the oil and gas industry.

Objectives of the Study

This study tends to determine the following:

1. Awareness and compliance level of oil and gas tanker drivers toward road signs.

2. Approaches for improving intrapersonal behaviours among oil and gas tanker drivers.
3. The effectiveness of the Federal Road Safety Officer's awareness methods
4. Perceive barriers to road sign compliance by oil and gas tanker drivers.

Literature Review

Various studies have explored road sign perception, comprehension, and compliance among diverse populations across different regions. For instance, studies such as Taamneh and Alkheder (2018) among Jordanian drivers and Bañares et al. (2018) with licensed drivers in the Philippines employed familiarity and comprehensibility tests to identify levels of understanding and effectiveness of traffic signs. However, these initial studies lacked consideration for the personal characteristics of respondents. In contrast, research like Ben-Bassat and Shinar (2018) focused on engineering students in Israel, revealing that variations in sign designs from other countries did not significantly affect comprehension, challenging established principles of familiarity and standardisation. Studies involving specific driver demographics, such as those of Sodikin et al. (2019) among Indonesian drivers and Ng and Chan (2016) among Hong Kong Chinese inactive drivers, emphasised the influence of personal characteristics like driving license type on sign comprehension.

Furthermore, surveys conducted on pedestrians in Nigerian cities like Warri metropolis and Ile-Ife highlighted gaps in awareness and compliance with road signs, urging for improved understanding and adherence for enhanced safety. Additionally, studies on road safety culture among international tourists in Thailand (Choocharukul & Sriroongvikrai, 2017), college students in India (Jothula & Sreeharshika, 2021), and drivers in Lahore, Pakistan (Shoaib et al., 2020), emphasised the importance of knowledge dissemination and adherence to regulations for safer road usage. However, variations in methodologies, study populations, and geographical contexts underscore the need for comprehensive approaches to address road safety concerns effectively. These findings highlight the importance of further qualitative research on road safety officers' perceptions of awareness and compliance with safety measures among oil and gas tanker drivers in North-Central Nigeria. Understanding these aspects is crucial for improving road safety and achieving SDGs. Table 1 shows the summary of the literature review.

Table 1: Summary of Literature Review

Author(s)	Population	Methodology	Findings	Gap/ Limitations
Mohammed, (2021)	Road users in Shashemene Town, Ethiopia	Descriptive and analytical methods	Identified road traffic safety problems and awareness issues.	The study is limited to one town in Ethiopia.
Jothula & Sreeharshika (2021)	College students in Telangana, India	Cross-sectional study	The study revealed the necessity of implementing knowledge, attitude, and practice regarding road safety regulations.	The study is limited to college students in one state of India.

Shoaib et al., (2020)	Drivers in Lahore, Pakistan	Questionnaire survey, interviews	The study examined the comprehensibility of road signs among drivers and its correlation with personal characteristics.	It is limited to drivers in Lahore.
Sodikin et al., (2019)	Indonesian drivers	Comprehensibility study involving personal characteristics	The type of driving license has a significant impact on comprehension. Commercial drivers have a better understanding.	Limited to Indonesian drivers, no mention of sampling technique.
Umar & Bashir, (2019)	Road users in Kano city, Nigeria	Questionnaire survey	The most uncomprehensible signs were identified, with factors such as sex, education, driving experience, and vehicle type affecting comprehension.	Differences from the present study in terms of subject area and methodology.
Ajakpovi & Happy, (2019)	Pedestrians in Warri metropolis, Nigeria	Descriptive survey research	Pedestrians are aware but lack understanding of road signs.	It is limited to pedestrians in one location.
Ndagire et al., (2019)	Motorcyclists in Kawempe Division, Kampala, Uganda	Cross-sectional study	Low compliance with road safety measures among commercial motorcyclists.	The sampling technique and data analysis method differ.
Nwaezeigwe, (2019)	Pedestrians in Ile-Ife, Nigeria	Primary and secondary data collection	Pedestrians are aware but have low compliance with road signs.	The study is limited to pedestrians in one location.
Taamneh & Alkheder, (2018)	Jordanian drivers	Familiarity and comprehensib	The study identified factors that	Does not consider personal

		ility tests, decision tree algorithm	affect comprehension, indicating that familiarity levels are higher than comprehensibility.	characteristics in the initial study.
Bañares et al., (2018)	Licensed drivers in the Philippines	Three-stage methodology, ergonomics principles	The study identified road warning signs with poor comprehensibility. It developed ergonomically-based alternative designs, subsequently testing their effectiveness with new respondents.	Does not consider the personal characteristics of respondents.
Ben-Bassat & Shinar, (2018)	Engineering students in Israel	Comprehensibility test using personal computers	Sign variations from other countries did not significantly affect comprehension —contradicting the importance of familiarity, standardisation, and compatibility.	Limited to engineering students in one location.
Choocharukul & Sriroongvikrai, (2017)	International tourists in Thailand	Questionnaire surveys, PLS-SEM	Safety culture implementation enhances driving performance. A positive safety culture improves driver efficiency.	It is limited to oil and gas tanker drivers in Malaysia.
Ng & Chan, (2016)	Hong Kong Chinese	Rating based on cognitive sign features	There is no difference in re-usability	It is limited to inactive drivers in one location.

	inactive drivers		performance between inactive drivers. Good design features aid re-usability.	

Methodology
Study design
This study uses phenomenology to understand the characteristics of phenomena and individual experiences (Rangarajan et al., 2022). The phenomenological design was chosen to deeply explore road safety officers' lived experiences and perceptions regarding tanker drivers' compliance with safety measures. This approach provides a comprehensive understanding of the challenges and barriers faced in enforcing road safety regulations. Face-to-face interviews were used to collect qualitative data on road sign awareness and adherence among Nigerian oil and gas tanker drivers, identifying perceived obstacles to effective compliance. Face-to-face interviews are systematic interviews in which participants' responses are recorded using a standard interview protocol (Stefkovics, 2022).

Study Area and Population of the study
The study was conducted in North-Central Nigeria. The population of this study comprises all Federal Road Safety Corps (FRSC) officers in North-Central Nigeria. This population was chosen because they directly monitor and enforce road safety measures, and their insights provide a grounded understanding of the challenges and effectiveness of current safety protocols (Brooks et al., 2019). This approach ensures that the data collected is relevant and reflective of practical, on-the-ground realities. The FRSC officers were from five (5) departments, namely: (1) Safety and Engineering, (2) Public Education, (3) Operations, (4) Rescue, and (5) Policy Research Statistics (PRS). As a component of this research, eight interviews were conducted upon reaching data saturation, each with a unique code. In qualitative research, small sample sizes (N<10) can achieve saturation, indicating the point at which minimal additional information is gained (Hennink & Kaiser, 2022). The distribution is balanced, with "Safety and Engineering," "Policy Research Statistics," and "Public Education" having two respondents, and "Rescue" and "Operations" having one respondent. The data suggests areas for further analysis, such as examining departmental roles and resource allocation. The entire interview process was recorded using a voice recorder. The participants were coded as FRSC1, FRSC2, FRSC3, FRSC4, FRSC5, FRSC6, FRSC7 and FRSC8.

Sample size and selection
The study employed purposive sampling, which ensures uniformity in variable operationalisation among participants (Mohammed, 2021). This sampling suits in-depth life history research with limited cases (Taamneh & Alkheder, 2018).

Ethical approval and administrative processes
The study received ethical clearance from Taylor's University, Malaysia, and participants provided informed consent. Confidentiality was maintained throughout the research, and recordings were securely stored after each session.

Interview process
A structured interview protocol was used as a guide during the interview. Qualitative interviews are an effective method for capturing in-depth insights and experiences of road safety officers. This approach allows participants to express their views comprehensively, providing rich, detailed data revealing nuanced issues and perceptions that quantitative

methods might not capture (Brooks et al., 2019). Thematic analysis was used to analyse interview responses, involving the development and application of 'codes' to deduce themes and review, define, and name these themes (Vaismoradi et al., 2013). The interview lasted two hours and thirty minutes, with responses fully audio-taped and transcribed by participants, resulting in 11,644 words.

The study utilised NVivo 12 to analyse ten samples from eight individuals, employing inductive and deductive thematic data analysis methods to determine their understanding of subjects. Thematic analysis is a data analysis methodology encompassing the generation and application of 'codes' to the data (Brooks et al., 2019). Thematic analysis is a method that uses 'codes' to classify data into themes and patterns, interpreting the product's meaning (Braun & Clarke, 2006). These steps offer a comprehensive method for gaining profound data insights, expediting the coding process, and fostering confident theme development. As shown in Figure 1.
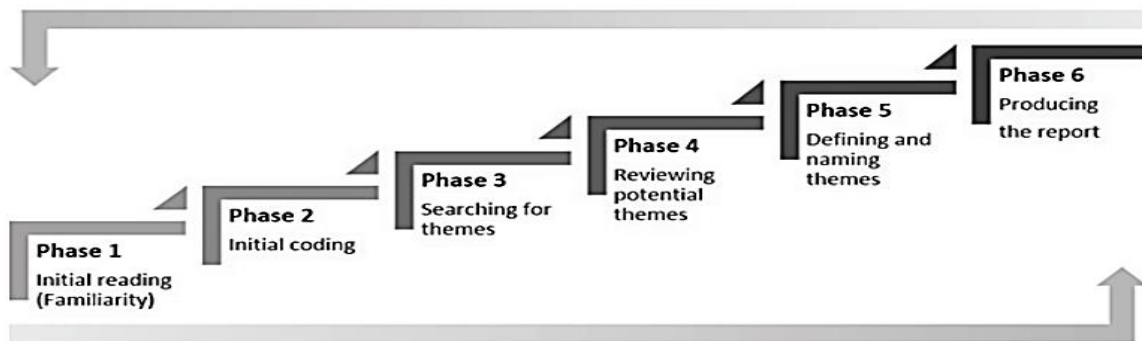

Figure 1: Six phases of thematic analysis revised diagram from (Braun & Clarke, 2006; Clarke & Braun, 2013).

The research process begins with Phase 1, where the researcher familiarises themselves with the data. This initial reading sets the groundwork for Phase 2, where the data undergoes coding to categorise its components. Phase 3 focuses on shifts to identifying overarching themes within the coded data. In Phase 4, these themes are meticulously reviewed and refined. Phase 5 involves clearly defining and naming the identified themes. Finally, Phase 6 concludes the process by synthesising the findings into a coherent and comprehensive report, marking the culmination of the research journey. This study identified sixteen themes based on an inductive approach. Deductive coding, followed by the informed data from the qualitative analysis, forms the theoretical lens practised with the mixed-method approach (John & Timothy, 2021; Morse, 2010). The study organised themes into common and diverse opinions and classified codes into themes and patterns. It represented respondents' ideas during the coding process, which was thoroughly and comprehensively validated.

Thematic Codebook
The thematic codebook categorises interview data, identifying common themes and agreement and identifying divergent perspectives requiring different approaches, as illustrated in Table 2.

Table 2: Thematic Codebook

Code	Respondents
Common Opinion	
Illiteracy	FRSC 1, FRSC 2, FRSC 3, FRSC 5, FRSC 7 and FRSC 8
Need for continuous education.	FRSC 4, FRSC 6, FRSC 7
Diverse Opinion	
Level of awareness and compliance	FRSC 1, FRSC 4
Effectiveness of training programs	FRSC 2, FRSC 5
Language barriers	FRSC 3, FRSC 8
Engagement with Federal Safety Officers	FRSC 1, FRSC 2, FRSC 6
Unionsm as a barrier	FRSC 4, FRSC 6

4.2 Frequency of Themes

The study used NVivo 12 and Microsoft Excel 2021 to analyse qualitative themes, revealing the frequency of various themes discussed in participants' responses, as illustrated in Table 3.

Table 3: Themes generated by participants' descriptions and theme frequencies

Themes	Description
Theme I	Level of awareness and compliance with road signs
Sub-theme 1	Illiteracy as a barrier to compliance
Sub-theme 2	Educational level and compliance
Sub-theme 3	Apathy toward road signs
Sub-theme 4	High level of awareness
Theme II	Enhancing intrapersonal behaviours of drivers
Sub-theme 1	Lack of awareness among young drivers
Sub-theme 2	Effectiveness of continuous training programs
Sub-theme 3	Illiteracy and language barriers
Sub-theme 4	Highway code embeds knowledge.
Theme III	Effectiveness of federal safety officers' awareness methods
Sub-theme 1	Engagement in various mediums
Sub-theme 2	Continuous training by safety officers
Sub-theme 3	Challenges due to illiteracy
Sub-theme 4	Public awareness programs
Theme IV	Perceived barriers to compliance
Sub-theme 1	Illiteracy and low education level
Sub-theme 2	Language barriers
Sub-theme 3	Important of continuous education
Sub-theme 4	Unionism as a barrier

The data shows that each theme appears in eight out of thirty-two (25%) instances, indicating an equal distribution across interview responses.

Results

Socio-demographic information

Respondents are predominantly within the age group of 44 years and above, constituting 50.0% of the sample, with an approximate mean age of 44. The sample is evenly split between male and female respondents, with each gender comprising (50.0%) of the total population. The Hausa ethnic group has the highest representation in the sample, comprising (50.0%) of the respondents. All the respondents have tertiary educational qualifications, indicating that the

sample comprises individuals with a higher education background. Most respondents (62.5%) have 21-30 years of working experience, with the mean working experience being approximately 25.5 years.

Theme I: Level of Awareness and Compliance with Road Signs
The qualitative data revealed that tanker drivers significantly vary their understanding and implementation of road signs. Many road safety officers pointed out this inconsistency. For instance, "*some drivers demonstrated a thorough understanding of safety protocols, whereas others lacked detailed knowledge (FRSC2, FRSC3 and FRSC 5)*". The study also revealed that ongoing training programs and licensing processes are designed to educate drivers on road rules and signs. However, the drivers' educational levels limit their effectiveness. According to FRSC 3, "*despite efforts to provide resources like the Highway Code, many drivers are unable to read and understand it*". The mandatory nature of these programs has increased awareness of the problem, yet significant challenges remain.

Theme II: Enhancing Intrapersonal Behaviours of Drivers
In examining the theme of "Enhancing Intrapersonal Behaviours of Drivers", the qualitative result highlights a significant deficiency in the awareness and conduct of drivers, particularly among the younger demographic, regarding road safety protocols and compliance with road signs. Road safety officers predominantly express this concern. FRSC 7 emphasises that "*current training methods lack a focus on intrapersonal behaviours and road sign knowledge*". The ineffectiveness of these methods is often attributed to drivers' literacy limitations and difficulties in understanding English alphabets. These challenges significantly hinder drivers' ability to comply with road signs effectively. Despite these concerns, FRSC 4 provides a contrasting perspective, suggesting that "*the Nigerian Highway Code effectively integrates crucial knowledge and attitudes towards road signs for drivers*". The Highway Code emphasises the importance of compliance. It highlights the consequences of non-compliance, encompassing factors such as posture, vision, memory, and confidence that impact driving behaviour.

Theme III: Effectiveness of Federal Safety Officers' Awareness Methods
The qualitative data underscores the significant role of Federal Road Safety Officers in promoting road safety among tanker drivers. According to FRSC 1, "*Officers engage with drivers in various settings, including worship centres, to educate them on using road signs*". The study revealed that the officers ensure effective communication by delivering road safety messages in local languages, catering to the linguistic diversity of communities. This approach enhances understanding and compliance with safety regulations among drivers across different regions. FRSC 4 highlights that "*this approach helps bridge the communication gap and ensures that safety messages are effectively conveyed*". The study also revealed that FRSC officers conduct regular training sessions with association heads and maintain continuous interaction at distribution stations. This fosters a collaborative approach to promote road safety and compliance within the tanker driver community. FRSC 7 mentions the "*use of radio programs to remind drivers of safe driving practices and road sign compliance*" to mitigate this issue. Additionally, first-time offenders are provided with public education to reinforce these safety messages.

Theme IV: Perceive Barriers to Road Sign Compliance by Oil and Gas Tanker Drivers
The qualitative analysis reveals a spectrum of perceptions and barriers influencing road sign compliance among drivers. Their perceptions and language barriers influence drivers'

behaviours regarding road sign compliance. Illiteracy and low educational levels are significant obstacles, hindering their understanding of road signs. Language barriers exacerbate these challenges, emphasising the need for tailored education programs to enhance compliance. *FRSC 5 and FRSC 1 identify illiteracy and low educational levels as primary barriers, hindering drivers' ability to understand and interpret road signs effectively.* The study also revealed that unionism poses a barrier to road safety enforcement efforts, as some drivers exploit their union connections to evade consequences for non-compliance. Some drivers may exploit their union connections to evade consequences for non-compliance, posing difficulties in enforcement efforts. *FRSC 4 identifies unionism as another barrier to compliance.*

Discussion

It is posited that the level of awareness and compliance with road signs significantly impacts the knowledge and practices of oil and gas tanker drivers about road sign compliance. The findings revealed that oil and gas tanker drivers' level of awareness is high. However, the compliance level is low due to illiteracy and educational deficiencies. While the drivers may understand laws and regulations well, their ability to read and interpret written road signs is compromised, highlighting the need for tailored educational interventions to enhance compliance. The findings corroborate with Liu et al. (2019) that illiteracy among drivers poses a significant barrier to compliance with road signs. Even when drivers are provided with materials such as the Highway Code, their inability to read and understand written information hampers their capacity to follow road signs effectively. This finding underscores the importance of addressing literacy issues among drivers to improve road safety (Üzümcüoğlu et al., 2020). The drivers' educational level is closely related to their compliance with road signs. These findings align with Castro et al. (2023), state that drivers with lower levels of education, many of whom are illiterate, are more likely to struggle with understanding and interpreting road signs. This study also revealed that the correlation between education and compliance implies that enhancing drivers' education can positively impact road safety. On a positive note, the findings concur with Hassanzadeh et al. (2020), revealing a high awareness level among drivers regarding the laws and regulations governing their profession. This awareness is attributed to the training and licensing requirements. Sangrar et al. (2019) assent that formal education and training positively impact drivers' knowledge of the rules, regulations, and signs relevant to their profession.

The findings on enhancing drivers' intrapersonal behaviours revealed that continuous training programs exist. However, limited effectiveness in shaping drivers' intrapersonal behaviours and attitudes toward road signs was observed. This result agrees with Xiang et al.'s (2021) findings that there is a lack of awareness, especially among younger drivers and helpers, regarding how to conduct themselves on the road and comply with road signs. This finding aligns with Liu et al. (2019), who state that illiteracy and language barriers significantly impede drivers' ability to understand and follow road signs. The study also revealed that the highway code in Nigeria plays a crucial role in embedding knowledge and attitudes toward road signs. However, ensuring drivers receive adequate training that translates this knowledge into practical compliance remains vital. This matches with Onuzuruike and Doreen (2022) on the need to train Nigerian drivers to prevent RTA due to poor road conditions and lack of adequate training and continuous education programmes for drivers.

The findings on the effectiveness of federal safety officers' awareness methods provide a comprehensive overview of the efforts made by federal safety officers to educate and enforce compliance with road signs among drivers, particularly tanker drivers. These efforts encompass various strategies and initiatives to address the challenges of illiteracy and promote a better understanding of road signs. Federal safety officers engage with drivers in diverse settings,

including worship centres, to educate them about proper road sign use (Chen et al., 2020). They also communicate with drivers in their local languages, which enhances comprehension and compliance. This approach recognises the importance of cultural and linguistic sensitivity in road safety education (Akpan et al., 2015). The officers train the bosses of the drivers, who, in turn, are expected to enlighten further and educate the drivers before they embark on trips (Mehdizadeh et al., 2019). This multi-level training approach ensures a comprehensive understanding of road signs and reinforces compliance. FRSC endeavours to augment awareness and adherence to road signs among drivers through various initiatives. These initiatives include radio programs to reinforce safe driving practices and compliance with road signs (Babalola et al., 2019). Engaging with unions representing drivers is another avenue through which challenges and issues related to compliance can be addressed effectively. This result matches Jung et al. (2020), who state that unionisation can pose distinctive challenges for frontline employees and managerial staff.

The findings on the perceived barriers to compliance with road signs underscore that some drivers in this context are illiterate and have low educational levels. This hampers their ability to understand and interpret road signs, primarily written instructions. The lack of literacy skills makes it challenging for them to comprehend signs, particularly when they lack accompanying graphic images or diagrams. Thus, this leads to reduced driver performance and potential safety risks. Even when drivers are provided with copies of the Highway Code, they may struggle to read and understand it. This is because English, the language used in most road signs, is not the first language of the drivers. The findings emphasise the significance of continuous education and awareness programs to improve compliance with road signs. Sangrar et al. (2019) state that due to the high illiteracy rate among drivers, these programs need to employ various methods to bridge the gap in understanding. Timmermans et al. (2020) corroborated that efforts such as local language translations, engagement with religious leaders, and personal interactions with drivers are crucial in ensuring drivers are aware of and comply with road signs. The study also revealed that unionism can sometimes hinder the enforcement of regulations. The drivers exploit their union connections to evade penalties or consequences for non-compliance. This challenges the authorities' efforts to ensure compliance with road signs and regulations (Ezeibe et al., 2019).

Conclusions

Nigeria's oil and gas tanker drivers face significant challenges in complying with road signs. Illiteracy and educational deficiencies hinder their ability to understand and interpret signage adequately. Despite efforts to provide training and educational materials, including the Nigerian Highway Code, many drivers struggle to comprehend written instructions, leading to subpar compliance levels. Furthermore, intrapersonal behaviours among drivers, especially younger ones, lack emphasis on current training methods. While the Highway Code embeds knowledge and attitude towards road signs, a notable gap exists in comprehensively addressing drivers' understanding and interpretation. This lack of focus on intrapersonal behaviours contributes to ongoing challenges in compliance with road signs. Federal Road Safety Officers are crucial in promoting awareness and adherence to road signs among drivers. However, the effectiveness of their awareness methods varies, with some drivers responding positively to engagement in local languages and community outreach programs. Despite these efforts, barriers such as illiteracy and union influence persist, hampering drivers' ability to comply with road signs effectively.

Recommendations
1. Implement literacy programs using simplified, visual educational materials to help drivers understand road signs.
2. Update training to cover intrapersonal behaviours and road sign compliance, including practical exercises and simulations.
3. Increase outreach with interactive sessions in local languages and collaborate with driver unions to better disseminate road safety information.
4. Strengthen educational and awareness programs to address illiteracy and language barriers and enforce regulations with penalties to reduce union influence on compliance.

Conflict of Interests: The authors declare no conflict of interest.

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