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# Can occupational safety and health problems be prevented or not? Exploring the perception of informal automobile artisans in Nigeria

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## ABSTRACT

It is well-known that informal workers in developing countries run a high risk of Occupational Safety and Health Problems (OSH problems). However, little is known about their perception of the preventability of these problems. This study explores how informal automobile artisans in Nigeria perceive the preventability of OSH problems and possible barriers to prevention. 43 artisans were purposively interviewed. Only one third of the participants perceived OSH problems as preventable while a majority perceived OSH problems as not preventable. Their perception of the causes of OSH problems and cost considerations strongly influenced their perceptions of the preventability of OSH problems. The major perceived barrier to prevention is economic insecurity and, as a consequence, non-availability of modern equipment. The study concluded that availability of accessible loans and regular training of the artisans may be helpful in preventing and reducing OSH problems in the informal sector.

## 1. Introduction

Hazards in the workplace are a huge but underexposed problem worldwide, but particularly in developing countries. According to the International Labour Organization (ILO), globally each year, 2.78 million workers die from work-related accidents or diseases, while 374 million suffer from non-fatal work-related accidents (ILO, 2019; Nuwayhid, 2004). Hämmäläinen et al., (2017) estimated that lost work-days gulp about 4 percent of global GDP. Although data from low- and middle-income countries (LMICs) are limited and of varying quality, the available reports point to much higher rates of work-related mortality in LMICs than in high-income countries (Hämmäläinen et al., 2017). For instance, Wu et al. (2018) reported that 92% of the occupational injury deaths occurred in LMICs in 2016. Work-related mortality and morbidity cause not only a colossal social and economic burden for enterprises and countries, but also large human and financial losses for workers and their families (Wang et al., 2018).

With 186 million inhabitants, Nigeria is the most populous LMIC in Africa. Although the country signed the ILO's Geneva Convention on

Occupational Safety and Health (OSH) in 1981, it is still struggling to implement and enforce OSH policies and regulations (Adeogun and Okafor, 2013). Moreover, an important challenge Nigeria shares with other LMICs is that the majority of its labour force (90%) is employed in the informal sector of the economy, which falls outside the purview of governmental labour and OSH regulations. Reliable national data on occupational injuries and diseases are not available in Nigeria (Diugwu et al., 2012). However, it is generally observed that informal workers are particularly vulnerable to occupational injuries and diseases due to combination of poverty and unsafe and hazardous working conditions (Rockefeller Foundation, 2013; Ahmed et al. 2018).

### 1.1. Occupational safety and health hazards

In the OSH literature an occupational hazard is generally defined as “any potential source that can cause injury or damage to the health of a worker” (Canadian Center of Occupational Health and Safety, 2020). More extensively, Gambhir et al. (2011) refer to it as “a work material, substance, process or situation that predisposes to disease or accident, or

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can directly cause disease or accident to workers in the workplace, even years after the workers might have left the workplace". Some hazards may have immediate harmful effects when they occur, such as injuries due to accidents (e.g., broken bones due to falling from heights). Many of them, however, are more hidden and not easily noticed, because there is a time lag between the exposure to the hazard and the onset of harmful consequences. (e.g., low back pain due to repetitive bending) (ILO, 2000; ILO, 2015).

A specific group of informal workers that is subject to occupational hazards are informal automobile artisans. About 40% of Nigeria's informal businesses are active in the automobile repair sector (National Bureau of Statistics Nigeria, 2010). Informal automobile artisans are responsible for keeping the growing number of cars roadworthy. Their services are in high demand because most Nigerians drive in used motor vehicles (locally referred to as 'tokunbo' vehicles), not being able to afford a new one, and most roads are in a bad condition (Ojo et al., 2017). Previous Nigerian studies reported numerous OSH problems among automobile artisans, including injuries to hands, fingers or eyes, burns, bruises, fractures, hand dermatitis, headaches, dizziness, tiredness, back-, waist- and joint pains and hearing impairment (Elenwo, 2018; Ojo et al., 2017; Adejumo et al., 2017; Saliu et al., 2015; Adeyemi et al., 2016; Johnson and Bassey, 2016; Sambo et al., 2012; Isah and Okojie, 2006). Data from the USA suggest that car repair workers are more likely to get injured or killed on the job than the average worker (Smith, 2007).

ILO distinguished 6 broad categories of work-related hazards that can affect the health of car mechanics: the exposure to physical-, chemical- and biological agents and to ergonomic, psychosocial and organizational risk factors. Previous studies of hazards in car repair workshops in Nigeria have found a number of specific hazards for artisans, such as the exposure to lead (Adejumo et al., 2017; Saliu et al., 2015), or solvents (Ojo et al., 2017), unsafe work-practices such as touching hot surfaces, working in awkward postures, carrying heavy weights, sucking petrol with one's mouth, washing hands with fuel (Sambo et al., 2012; Adeyemi et al., 2016).

### 1.2. Prevention of OSH problems

Previous studies have shown that most work-related accidents and diseases are preventable if exposure to OSH hazards is reduced or eliminated (Hui-Nee, 2014). Prevention could be realized by implementing sector-specific OSH guidelines such as those developed by the ILO (e.g., ILO, 2000 ; Health and Safety Executive, 2009). For vehicle repair workers, OSH guidelines include such recommendations as using safety devices on equipment, providing adequate barriers that separate vehicles from workers, discarding outdated equipment, providing adequate protection against falls and chemical exposure, and encouraging the use of personal protective equipment (PPE) by workers (COSHnetwork, 2016; Oranusi et al., 2014). However, these recommended preventive measures, and the OSH laws that prescribe their employment, are targeted mostly at formal organizations where the employers have corporate responsibility for the health and safety of their employees (ISSA, 2014; Lund et al., 2016; Legg et al., 2015). In developing countries, there are no laws that regulate OSH for informal workers. Hence, incorporating OSH measures in their workplaces is not a legal necessity for these workers.

### 1.3. Barriers to prevention

Besides the absence of adequate Government regulation and surveillance, previous research has identified a number of other barriers to OSH for informal sector workers in Africa. Lund (2016), Bamu-Chipunza (2018) and Rasheed (2017) argued that poverty and income insecurity make it often impossible for informal workers and businesses to invest in PPE and other safety devices that are relevant to their work. In a literature review focused on the construction industry, Umeokafor et al

(2014) argue, based on Diugwu et al. (2012) and Idubor and Oisamoje (2013), that there is a general lack of awareness of OSH in Nigerian society, which affects all workers in both the formal and the informal sector. Olsen et al. (2010) and Hasle et al. (2009) also found that poor knowledge of the long-term effects of chemical agents at the workplace and a belief that such agents are not dangerous negatively affect prevention of the use of such agents. Umeokafor et al. (2014) suggest that beliefs, be it religious or superstitious, often filter into work environments resulting in a lack of compliance with OSH regulations in the construction industry Africa-wide. To support this, the authors cited Idubor and Oisamoje (2013), who showed that "some construction workers believe that accidents are "acts of God, i.e., accidents occur because God allows them." (Umeokafor et al., 2014: 3). Beliefs that accidents at work happen due to external forces, like fate, do not only occur among construction workers in Africa. In a qualitative study, Hasle (2009) found that owners of small construction and metal businesses in Denmark attributed the cause of serious accidents to unforeseeable circumstances or fate, thereby distancing themselves from their own responsibility to implement preventive measures. Studies from Bangladesh (Patwary et al. 2012), Europe (Alexopoulos et al., 2009) and Canada (Eakin et al. 2010) reported similar findings, namely that (formal) workers would attribute the occurrence of accidents to unforeseeable circumstances or fate. There is a growing awareness among OSH researchers that it is relevant and necessary to take the perspective of workers themselves into account if we want to develop effective programs to reduce workplace hazards (Kogi, 2006, Eakin et al., 2010).

The available OSH literature usually refers to workers in the informal sector in general without allusion to specific occupations. However, different occupational groups are likely to face specific challenges as they have particular perceptions of the causes and prevention of OSH (Lyneis and Madnick, 2008; Kouabenan, 2009; Hasle et al., 2009). In view of the numerous OSH hazards automobile artisans in developing countries are faced with; it is relevant to explore the views of a specific group of informal workers on how to prevent or reduce these hazards.

### 1.4. Aim of the study

The aim of this study is to explore the perception by informal automobile artisans of the causes and preventability of OSH problems in Nigeria. We also aim to identify what the barriers are for the prevention of OSH problems among these artisans. More specifically, the study seeks to:

- chart the perception of the artisans of the causes of OSH problems;
- explore the extent to which the artisans perceive OSH problems as preventable; and
- investigate what they perceive as the main barriers for preventing OSH problems.

## 2. Method

This exploratory study adopts a qualitative inductive approach. No preconceived hypotheses were formulated because the aim was to understand the artisans' perception on the prevention of OSH problems. An exploratory study is useful for uncovering a yet largely unexplored phenomenon of interest (Swedberg, 2018); the ensuing results allow researchers to better understand the nuances and details of complex social phenomena from the participants' perspective. Although the findings cannot be said to be true for everyone, they reveal multiple layers of meaning for a specific group of people. This level of understanding is particularly essential when studying human behaviour and trying to detect how it interacts with people's perceptions, attitudes, and beliefs (Ellsberg and Heise, 2005).

With our qualitative approach, we seek to explain 'how' and 'why' a particular phenomenon or behaviour operates as it does in a particular context. This explanation is crucial to achieving results without having a

pre-controlled frame of causes and consequences as used in quantitative methods. Hindle (2004) argues that qualitative research promotes deeper perception and the proclivity to gain knowledge directly from the study participants. Likewise, Dana and Dana (2005) contend that qualitative research is useful for exploratory research because of its flexibility. To understand the artisans' perception concerning preventability of OSH problems, we used in-depth interviews to obtain relevant information from the participants. These interviews yielded direct quotes from study participants regarding their worldviews, principles, judgments, objectives, activities, and perceptions.

### 2.1. Study group

Automobile artisans working in small informal enterprises were selected in three urban areas of Iwo, Ile-Ife, and Osogbo in Osun State, Nigeria. These locations represent the three administrative zones in the state. Osun State was chosen because many automobile artisans in this state operate along the road without a structured workplace, unlike those in big cities like Lagos and Ibadan (Baba, 2010; Adejumo et al., 2017). Inclusion criteria were 'type of occupation' - mechanics, vulcanizers, painters, or panel beaters; and 'position' - master or apprentice. The first criterion was chosen because these groups constitute the most common occupational groups in the informal automobile repair sector in Nigeria, and they tend to be exposed to different OSH hazards (Elenwo, 2018). The second criterion was chosen because we wanted to interview both experienced and less artisans. Almost all automobile artisans in Osun State belong to local chapters of their respective trade associations (Baba, 2010; Adeyemi et al., 2016). The chairmen of the local chapters of these associations referred participants to the researchers because a pilot study had shown that without their consent, access to the informal artisans would be challenging. None of the invited participants refused to participate.

The initial decision was to purposively select five artisans in each group in the three study locations (a total of 60 participants). However, data saturation was reached after 43 artisans were interviewed; this number was considered sufficient to draw reliable conclusions (Mason, 2010; Creswell, 2014). The sample of participants consisted of 39 master artisans and four apprentices from the three locations. Only four apprentices participated in the study because most of the artisans did not have apprentices.

### 2.2. Data collection

Before the study proper, we conducted a pilot study between July and August 2016 to explore issues and barriers related to recruiting the study participants. Moreover, to see how conducting research among the group would work in practice (Kim, 2011). The data collection for this study took place between January and March 2017. Based on the pilot study, the researcher developed a semi-structured interview guide. A semi-structured interview approach was chosen for three reasons; first, to ensure that the interview followed the study objectives; second, to ensure that all the relevant themes were raised and lastly, to provide a probe when further information was required (Seidman, 2013). The interviews focussed on the artisans' perception of the causes of OSH problems, how they thought they were preventable or why they believed they were not preventable? Barriers to prevention were also explored. To allow the participants to focus on the issues that were crucial to them, the interview questions were inobtrusive and non-directive, in line with Alan's (2015) guidelines for conducting qualitative interviews. Examples of such questions are "in your own opinion, what can you say causes health problems at your workplace?" and "what are your thoughts regarding preventability of OSH problems?" Various probes used for each topic provided the interviewer with the flexibility to follow up, clarify participants' responses, and adapt interviews as the study progressed (Lincoln and Guba, 1985).

An expert in the field of African Languages and Literature translated

the interview guide to the Yoruba language in order to communicate clear ideas to the artisans. The interviews were held at the participants' workplaces, and they took an average of one-and-a-half hours for each participant. The researcher took the lead, while an assistant took notes for all the interviews for the purpose of consistency. After each interview session, the researcher immediately wrote field notes describing the interview context and identified new emerging themes. The first two interview transcriptions were sent to an expert who read and pointed out other areas to probe in subsequent interviews.

Informed consent was obtained from the participants after obtaining initial consent from the chairmen of the associations. The study's purpose was clearly communicated to the participants, and they were assured of privacy and confidentiality. Ethical clearance was obtained from the Health Research Ethics Committee of the Institute of Public Health, Obafemi Awolowo University, Ile-Ife, Nigeria. with HREC no: IPHOAU/12/764. The participants were given a liquid soap and towel as a token of appreciation for participating in the study. They were not aware of the gift beforehand.

### 2.3. Data analysis

All the interviews were audio-recorded and transcribed by three professional transcriptionists using identifiers such as; location, position, and the type of work. The interviews were first transcribed in the Yoruba language and then translated into English to ensure completeness. To ensure the credibility and trustworthiness of the findings, we took the following procedures: cross-checking the audio recording with the transcription for accuracy; importing all the interview transcripts into MAXQDA software for data analysis, processing, ordering, and comparison of the results at different stages (Kuckartz, 2007) and selecting and coding the phrases that were relevant to the study objectives. The researcher independently selected and coded interview fragments and developed coding schemes. Results were read and amended if necessary by two other assessors and the researcher. Amendments were made based on consensus. This extra measure delivered a neutral perspective on the trustworthiness of the coding arrangement and the emergent theoretical structure (Strauss and Corbin, 2014). Standard procedures for reporting interview data were adhered to in presenting the results (Tong et al., 2007).

## 3. Results

Table 1 gives some descriptive characteristics of the 43 participants. All were male, 12 (27.9%) were mechanics or panel beaters, 11 (25.6%) vulcanizers, and 8 (18.6%) were painters. All participants were religious. 17 (39.5%) practising Christianity and 26 (60.5%) Islam. 22 (51.2%) received primary education or less, and 20 (46.6%) both technical and secondary education. 25 (89.3%) had more than 10 years of working experience, and 36 (83.9%) were above 40 years of age.

### 3.1. Perceived causes of OSH problems

The interviews revealed divergent views on what the artisans perceived to be the causes of work-related health problems (see Table 2). These causes can be categorized into two broad groups: work and worker-related causes (job characteristics; worker-related individual factors); and non-work-related causes (cultural view). These perceived causes are not mutually exclusive, as many participants mentioned more than one cause.

All participants reported several aspects of their job that could lead to health problems. These factors included unsafe workplace, work procedures, working conditions, the equipment and materials they worked with, and exposure to chemicals and injurious substances. For example, working with a part of one's body (legs, buttocks) on the motor road was a commonly mentioned health hazard by mechanics and vulcanizers. Painters identified the hazards of constant exposure to

**Table 1**  
Socio-demographic characteristics of the participants.

Characteristics	N = 43(%)
<b>Profession</b>	
Mechanics	12 (27.9%)
Panel beaters	12 (27.9%)
Painters	8 (18.6%)
Vulcanizers	11 (25.6%)
<b>Age group</b>	
<20	1 (2.3%)
20–39	6 (13.8%)
>=40	36 (83.9%)
<b>Position</b>	
Master	39 (90.7%)
Apprentice	4 (9.3%)
<b>Religion</b>	
Christianity	17 (39.5%)
Islam	26 (60.5%)
<b>Years of experience</b>	
<10	3 (10.7%)
10–30	12 (42.9%)
>30	13 (46.4%)
<b>Educational level</b>	
No formal education	2 (4.7%)
Primary education	20 (46.5%)
Technical/Modern	6 (14.0%)
Secondary	14 (32.6%)
Post-Secondary	1 (2.3%)

**Table 2**  
Perception of accident causation by automobile artisans in Osun State, Nigeria.

Causes of illnesses and accidents	Painters N=8	Vulcanizers N=11	Mechanics N=12	Panel beaters N=12
Job characteristics				
• Job related factors	8	11	12	12
– Unsafe workplace				
– Work procedure				
– Working conditions				
• Equipment/work materials	3	11	8	11
– Work materials				
• Exposure to chemicals/substances	8		1	2
Worker’s related individual factors	7	10	12	12
• Alcoholic drink				
• Unsettled mind				
• Lack of adequate knowledge of the work				
• Greediness				
• Worker’s carelessness				
• Mistakes				
• Unsafe work practices	6	9	12	11
– Inexperience apprentice				
– Others related factors				
– Working alone				
Cultural/religious beliefs	4	9	6	7
• Worker’s dubious character				
• God’s will				
• Destiny				
• Preternatural forces				
• Accident happened to prevent graver situation				

\*The numbers represent counts hits only once per document.

chemicals as well as falling off a ladder. The mechanics and panel beaters reported having been hit by falling objects, like a jack or an engine, and exposure to chemicals. Panel beaters mentioned carbide and gas tank explosions while the vulcanizers identified tyre explosions. Orally sucking of petrol was commonly mentioned by mechanics.

A mechanic reported:

*If the person sucking petrol from the vehicle is not careful, he will faint because of the gas.....ID22*

Some of the artisans (10) reported an unsafe workplace as a cause of illnesses like malaria because they work under the sun. The work environment is also usually full of sharp objects like an iron sheet, and the workplace’s ground is not cemented. A mechanic explained the hazard in working in such a place:

*...jack will sink into the ground when we are working under the vehicle... this is what causes a problem in most cases; the person under the vehicle will not know that the jack is sinking (ID 19)*

Besides, other people in the work environment can cause a problem for the artisan while working. For instance, a painter said:

*Even when you are careful, a careless person might cause an accident.....we have people who injure innocent victims with their carelessness. (ID2)*

Moreover, some artisans attributed the absence of apprentices or co-workers as factors responsible for workplace accidents. The panel beaters, mechanics, and painters reported that their job characteristics require them to have assistants who will help them in their work. A panel beater explained:

*Fire incidence is not frequent when we had apprentices, this is because as the master is welding something under the vehicle, the apprentice will be watching the upper part and will be putting water in any area where he noticed smoke. If it is something the apprentice could not handle, he will ask the master to stop welding because somewhere is burning. (ID32)*

Equipment and work materials were also mentioned as potential sources of accidents. A vulcanizer gave an example of problems they could have with the work materials:

*In a bid to pump a tyre, it can burst because of the internal weakness which the worker might not know about...especially as we do not have any instrument that can tell us the strength of the tyre. (ID14)*

A panel beater compared the kind of tools that foreigners were using with those used in Nigeria and concluded:

*In foreign countries, their tools are designed in a way that will not give them stress, but here, we use all our strength to work. (ID32)*

A painter also reported the cumulative effect of constant exposure to chemicals:

*The chemicals we are using for spraying and thinning are hazardous..... Our father here can testify to the fact that the chemical has seriously affected some of our elders. They inhaled it and it caused serious damage to their health. (ID8)*

All the participants mentioned worker-related factors as another cause, such as a worker’s character and attitude (e.g., failure to put extra chock under the vehicle after jacking it up); lack of concentration while working; greediness (e.g., failure to change faulty tools when due and failure to ask for help when necessary because of costs); unsafe work practices (e.g., working on faulty cars on the road without looking sideways for oncoming traffic); working under the influence of alcohol, and lack of adequate knowledge of the work or task to be done.

A panel beater said:

*Greediness can cause an accident because workers might not want to spend money on changing faulty equipment. (ID37)*

Lastly, some of the participants (25) from all professions reported that religious or cultural factors like God’s will, preternatural forces, and destiny were responsible for OSH problems. For example, they explained that a minor accident at the workplace could be a way by which God protects a worker from a more serious incident outside the workplace. For instance, a panel beater who had been seriously injured at work said:

*God used to allow accidents at the workplace to happen in order to prevent more terrible occurrences outside workplace. (ID39)*

The artisans explained that if a worker had been destined to experience a workplace accident, the person could do nothing to avert it because it is God’s will. Moreover, OSH problems can be attributed to preternatural forces. A painter reported:

*From the things we have heard from our elders, we will know that evil*

forces are real..... Some accidents are caused by evil forces. (ID2)

Some artisans also believed that a worker who is unfaithful in dealing with customers, for example, someone who lies to customers about the extent of the repairs to be done so as to earn more money, exposes himself to workplace danger. A vulcanizer said:

*If a tyre is leaking in one place, some will say it is in two places so that he can collect more money from the customer.....Some will collect money from customers and will not do the work; such a one may experience a workplace accident. (ID13)*

### 3.2. Preventability of health problems

In response to whether OSH problems are preventable or not, a majority of participants (25) believed they are not preventable, while the rest (14) believed they could be prevented. Different aspects of the perceived causes of OSH problems influence these perceptions. Whereas some of the OSH problems caused by work/workers' related factors are seen to be preventable to a certain extent, almost all the OSH problems caused by non-work-related (cultural or religious) factors are seen as non-preventable. Table 3 gives an overview of the reasons for these perceptions.

### 3.3. OSH problems are preventable

The artisans indicating that OSH problems are preventable (see Table 4) believed that job characteristics are the main cause of OSH problems. Making sure the work environment is free from broken pieces of iron, changing faulty equipment such as hoses (panel beaters), gauges (vulcanizers), spanners (mechanics), the use of personal protective equipment (PPE) like nose covers, or drinking of milk after painting (painters) were identified as ways to prevent OSH problems. Vulcanizers said the best way to prevent OSH problems caused by bad tyres is by refusing pressure from customers to work unsafely.

*if someone has been using the hose for at least six months, he should change it.....this is because the hose would have been weakened after six months through sun and rain....it will easily attract fire. (Panel beater, ID32)*

*If a customer asks me to fill the pressure of his tyre to 40 and I feel that it will be too much for the tyre, I will reduce it to 30. If he insists on 40, I will give him the nozzle to pump the tyre himself, because I don't want to be injured. (Vulcanizer, ID16)*

*The safety measure one must take is to drink milk after painting or else one will be dying gradually. This is because the paint is poisonous, and you might have inhaled it..... (Painter, ID1)*

Other PPE identified by the artisans as means of preventing OSH problems includes boots to protect the legs from injury (panel beater, mechanic), goggles to protect the eyes during panel beating process (panel beater), overalls to protect the body (painters, panel beaters, mechanic), gloves to protect the hand (panel beater, painters, mechanic), spraying helmet to cover the head (painters), and nose-cover to prevent dust (vulcanizer, painter, panel beater).

According to the participants, some of the OSH problems caused by individual worker-related factors such as lack of adequate knowledge of the work, greediness, carelessness, and taking alcoholic drinks during work are preventable if the artisans changed these behaviours. For instance, an artisan must be ready to employ the assistance of a fellow artisan if he has much work to do, especially if he does not have an apprentice. He must not decide to do the work alone in order to maximize profit. Furthermore, artisans must work with patience; improve personal competence, and work safely. Moreover, putting an extra chock under the vehicle after jacking it, taking extra precautions while working, and concentrating on the work at hand may prevent OSH problems caused by individual worker's factor. A vulcanizer, a painter, and a mechanic said, respectively:

*if we can stop drinking alcohol and taking hard drugs, accidents at the workplace will reduce. (ID15)*

**Table 3**  
Perception of the artisans about preventability of OSH problems.

	Perceived causes	Preventability of OSH problems	
		Preventable: How	Not preventable: Why
Work/workers' related factors	Job characteristics		
	-Job related factors	Make work environment clean from sharp metals...	Hazards are part of the job  Careless person can cause OSH problems for artisan that is working...
	-Equipment/work materials	Reject dangerous work material, take proper care of tools, change the faulty tools...	Equipment are inappropriate, availability of dangerous/old work materials in the country, modern equipment are expensive...
	-Exposure to chemicals/substances	Use PPE	We are not use to PPE; our job does not need PPE, no appropriate PPE for our job...
	Worker's related individual factors		
	-Unsafe work practices	Put extra chock after jacking the tyre, take extra precaution while working...	The workplaces are located along the road.  The quickest way of getting the petrol from car is by siphoning by mouth...
	-Alcoholic drink	Stop drinking while working	
	-Unsettled mind	Concentrate while working	Economic situation of the country that caused income insecurity for workers....
	-lack of adequate knowledge of the work	Improve personal competence	
	-Greediness	Ask for assistance if the work is too much for the artisan....	
Non-work related factors	-Mistakes	Work carefully and with patient....	Mistakes at work are inevitable
	Cultural beliefs		
	-God's will		Only God can prevent OSH problems There is nothing any mortal can do about it because it has been destined to happen The person bewitched might not know he has been bewitched
	-Destiny		
	-Preternatural		
	-Worker's dubious character	Worker should be truthful in dealing with customers	
	-Accident happened to prevent graver situation		It is a way of God preventing graver situation outside workplace

*We must be very patient in all the things we do... If you are going to work as a painter, you must be patient. (ID3)*

*We used to put an extra chock to support the vehicle after using the jack to prevent the vehicle from falling on us. (ID28)*

Some participants believed that abiding by cultural or religious beliefs might protect the worker from harm. For instance, it was thought that when an artisan is faithful in his dealing with customers either by

**Table 4**  
Perception of the automobile artisans of the causes and the preventability of safety and health problems at the workplace\*

Causes of OSH problems	Total	Preventable	Not Preventable
Work-related causes of OSH problems	39	14	25
• Job characteristics	13	6	7
Exposure to chemicals/substances			
Others related factors			
Equipment/work materials			
• Worker's related individual factors	15	7	8
Unsafe work practices			
Alcoholic drink			
Unsettled mind			
Lack of adequate knowledge of the work			
Greediness			
Worker's carelessness			
Mistakes			
• Non-work related causes of OSH problems	11	1	10
God's will			
Destiny			
Preternatural forces			
Cultural beliefs			
Total	39	14	25

\* the numbers represent counts hits only once per document in the code relations between perceived preventability and accident causation.

doing a good repair or by being truthful about the extent of the damage, the artisan will not be subject to a workplace accident. A mechanic said:

*We believe if a mechanic does the repair very well, irrespective of the amount we might collect as charges from the customer, no evil will happen to him.....* (ID23)

He explained further,

*Cars are made of iron, and it is believed that Ogun is the god of iron; if a mechanic works with truthfulness, he will not incur the wrath of Ogun and will not be injured.* (ID23)

### 3.4. OSH problems are not preventable

According to two-thirds of the participants, OSH problems could not be prevented (Table 4). They put forward many reasons why the prevention of OSH problems was not possible in the workplace.

Some participants said that accidents and injuries at the workplace were an unavoidable phenomenon because hazards are part of the job. For instance, they argued that working under the sun or on the road can only be avoided by quitting one's job.

*Nowhere is free of hazards or risks in our workplaces. Even if you are as wise as a tortoise, you will still encounter danger.... I have experienced accidents on the job before. My other partner, too, experienced accidents before; the tyre burst and affected him. So it is not possible to avert problems because of the way we are repairing tyres exposes us to those hazards. The hazards are part of the job we are doing.* (Vulcanizer, ID13)

*In my own opinion, there is nothing we can do unless we are ready to stop the job. If you are not ready to leave the job, you can only pray that any hazard you encounter will not get out of hand. Nothing can be done to prevent hazards unless we are ready to stop working.* (Painter, ID7)

Another perceived reason for the idea that OSH problems cannot be prevented, is that these problems are caused by other careless people and not by the artisan himself.

Another reason for the perceived non-preventability of OSH problems is the notion that mistakes at the workplace are inevitable. According to the artisans, no one will intentionally plan to have an accident, it is usually caused by mistake somewhere along the line, and therefore it is not preventable. A mechanic and a panel beater put it this way:

*There are times when we mistakenly cut our hands with razors, we may want to lose something and get hurt, or something might pinch us.... You*

*cannot walk without shaking your head; you cannot master mistake* (ID24)

*No artisan will joke with his work because it is where he gets his daily food, so it is an unplanned event.... Mistakes are inevitable.* (ID31)

Furthermore, cultural/religious beliefs about external forces beyond the artisan's control influenced their perception of the non-preventability of OSH problems. According to artisans who mentioned this, only God can prevent OSH problems because this is beyond the artisan's control. This statement also refers to OSH problems which are believed to be caused by preternatural forces or fate. For example, according to a panel beater,

*... the work of evil ones in the family is a contributory factor to accidents at the workplace so it cannot be prevented, for instance, someone that has been bewitched and does not know can have an accident at work.* (ID39)

A vulcanizer stated:

*We can use nothing to protect ourselves other than to trust in God's protection, this is because no protector can prevent the tyre from bursting.* (ID13)

Thus, the foregoing shows that artisans who attributed causation of OSH problems to preternatural forces, God's will, or destiny/fate typically felt that such problems are not preventable.

### 3.5. Barriers to prevention

Even if artisans reported that OSH are preventable, two-third of them reported several barriers to put this into practice. The perceived barriers to prevention could be grouped under three broad categories - economic, work material, and external/structural factors (Table 5). However, these factors are connected. For instance, an economic factor such as income insecurity was often perceived as a barrier to artisans' ability to purchase safety equipment and PPE for their work.

*The economic situation in the country is terrible. Some people have repairs on their vehicles, but they do not have money because of irregular salary. For example, some people came to recall their vehicles just last week because they did not have money to pay to continue with the repair.* (Panel beater, ID30)

*Money is very important. Is it someone that has been in the shop for about two months without a job that will go and buy gloves?* (Painter, ID5)

A vulcanizer reported:

*At the Osogbo seminar, I saw some engines (modern equipment) that will remove the tyre from the car, patch it and replace it but they are expensive, I cannot afford it .... I have interest in buying that engine up till now, but when I asked for the price, I was told it was N700, 000 [\$1,931] (ID12)*

The mechanics also reported the availability of equipment that could lift an engine from the vehicle (crane) instead of manual lifting, but many of them could not afford it. Apart from not having enough money

**Table 5**  
Perceived barriers to occupational safety and health problems among the automobile artisans in Osun State, Nigeria.

Barriers to prevention	Painters N = 8	Vulcanizers N = 11	Mechanics N = 12	Panel beaters N = 12
o Job characteristics				
Economic related	8	11	12	12
Lack of good and safe workplace				
Lack of money				
• External related	7	10	12	12
Technology related				
Old model cars still in use				
Economic situation in the country				
Unstable policies				
• Individual related	4	9	6	7
Unstable mind				
Belief that one cannot be harmed				

\*number of times the quotes appear in the documents.

to purchase tools and equipment, some of them also reported unavailability of some tools/PPEs that are appropriate to their work. For instance, a vulcanizer said instruments that could give information about the inherent weakness of tyres are not available:

*You see, there is nothing we can use to detect bad tyres, assuming there is equipment that can detect the tyre's condition, perhaps that will help, but we do not have it. We may not know whether a tyre is good or bad until we pump it; customers usually bring deflated tyres for repairs.* (ID14)

Moreover, a mechanic said the available gloves are not suitable for their type of work because they were made of rubber.

*In terms of gloves, I do not know how it can be possible for artisans to be using it. This is because most of the tools we are using are metals, and we deal with oil a lot, so there is no way it will not be slippery. If there is a way it can be done to prevent slippery, it will be fine.* (ID22)

Moreover, the repair of old vehicles seems to encourage unsafe practices such as using the mouth to siphon petrol. Likewise, tyres with rings still exist, which also hinders OSH problem prevention. Besides, the sometimes dreary process of acquiring new modern tools described by some artisans was also identified as a barrier, as is exemplified by the painter.

*You have to make bookings for some of this equipment; you would have paid in advance. People are no longer trustworthy; even if you take the risk of borrowing money to buy it, you might not see what you paid for, and you will have ended up wasting the money.* (ID3)

Another group of perceived barriers to prevention was linked to external structural factors such as continuous irregularities of government workers' salaries, electricity, and petrol supply in Nigeria. Also mentioned was the decrease in the number of youths learning artisanal work and non-availability of fixed places for doing their work, such as mechanic village. They reported that the lack of appropriate structural facilities took their minds away from their job:

*Irregularity of electricity and petrol supply in this country is affecting us adversely.... Someone bought an electric machine for his work, and there is no electricity most of the time..... How will the brain of the artisan function?* (Panel beater, ID31)

*You see, assuming our government encourages us, they can build a mechanic village for us, equip the place for us. They can even be taking taxes from us* (Mechanic, ID19)

The few masters with an apprentice reported they had to give the apprentices daily stipends in order to encourage them stay on the job. Working without apprentices or co-workers is a barrier to preventing OSH problems because, according to the participants, car repair cannot be done without assistance. However, artisans noticed a low interest among young people to become an apprentice, and the master saw the fees needed to pay apprentices as a problem.

Even though some of the artisans mentioned the lack of appropriate PPE as preventing OSH problems, many of them said they would not use them if they were available. When asked why not wanting to use PPE, some artisans said they were not accustomed to it. For instance, a vulcanizer said:

*Why should we use PPE? Our work does not need that. A bad tyre is the cause of harm to the artisan, and many had lost their lives because of it.* (ID17)

And a painter said:

*Most of our people do not care about using nose guards because they believe they are energetic..... You know we blacks have the belief that we are very strong, and so disregard safety measures.* (ID7)

A mechanic reported:

*We normally siphon petrol from the vehicle with our mouth. We do not see anything wrong in doing that. Even we drink petrol. If you do not want your son to drink petrol then you should not allow him to learn mechanic. We drink it deliberately because we regard it as a medicine.* (ID21)

When probed further, he said:

*It is medicine for worms. You can use it to de-worm. If someone has plenty of worms in his stomach, petrol is a good worm medicine.* (ID21)

A panel beater who was involved in a serious workplace accident was

asked why he was not using goggles to weld after the accident that blinded one of his eyes responded:

*... if you start using goggles, people might misunderstand it to mean you are pompous. If they see someone who wants to bring work to you, they might discourage the fellow asking him if he wants to give his work to that man who is too pompous.* (ID41)

## 4. Discussion and conclusion

### 4.1. Discussion

This study is, to the authors' knowledge, the first to use a qualitative method with in-depth interviews to explore the perception of informal automobile artisans in Nigeria on the causes and preventability of OSH problems and barriers to prevention. The strength of this method is that it builds on the direct experiences of the artisans to increase our understanding of what is done and could be done to prevent OSH problems in the sector. The participants' perception of the causes of work-related injuries and diseases clearly influenced the perception of their preventability. This is in line with previous studies which have shown that perception plays a significant role in OSH problem prevention (Lyneis and Madnick, 2008; Kouabenan, 2009).

The artisans attributed the causes of OSH problems to two main factors: 1) work or worker-related causes (job characteristics, individual worker attributes), 2) and non-work-related causes (cultural and religious beliefs). The findings related to job characteristics are in accordance with previous studies that reported cumulative negative effects of unfavourable job characteristics on worker's health (Fletcher et al., 2011; Ahmed et al., 2018; Johnson and Bassey, 2016). For example, Ahmed et al., (2018) reported that hazardous chemicals and noise cause OSH problems in the informal industrial segment of Pakistan. Our finding that (serious) OSH problems are perceived to be caused by cultural and religious factors is in line with Gyekye and Salminen's (2007a) findings from a study among workers in Ghana. The researchers found that socio-religious beliefs play a significant role in workers' accident analysis. The religious and cultural beliefs we identified in this study are typically rooted in the Yoruba culture (Jegade, 2002; Odejobi, 2014; Koster, 2003). The attribution of the cause of OSH problems to external factors such as fate is not only common in African countries, however. For example, Hasle et al (2009) found that small enterprise owners in high-income countries also attributed the cause of more serious accidents to unforeseeable circumstances (bad luck). According to Hasle, such attributions are self- or group-defensive in the sense that workers try to protect themselves or their group from blame through the externalization of causality. The present study suggests that those ideas about religion and the influence of preternatural forces common in the Yoruba culture also reinforced self- or group-defensive interpretation of OSH hazards among the group of informal automobile artisans. For instance, these artisans believe that only prayer to God can offer protection against OSH problems. This is not surprising because, in the Yoruba society, religion is inseparable from other areas of life, be it family affairs, health care, politics, or economy (Odejobi, 2014). Therefore, religion is brought into every sphere of life, including the workplace. Although religion and prayer can serve as a coping mechanism for individual workers, they may also prevent them from taking appropriate preventive measures such as using PPE (Gyekye and Salminen, 2007; Patwary et al., 2012).

We also found that causal explanation of OSH problems affects the artisans' perception of whether and how they can be prevented or not. Most of the OSH problems the study participants attributed to work-or-worker-related factors were seen as preventable to a certain extent, while most OSH problems that they attributed to cultural or religious beliefs were seen as unpreventable because they were beyond the workers' control. This fatalistic belief is in line with findings from other studies (Kouabenan, 2009; Kayani et al., 2010). For example, Kayani et al., (2010) reported that many people believe in divine discretion and

magical powers as causes of road accidents in different parts of the world. They concluded that such beliefs might cause individuals to resign to risk and neglect safety measures because they feel powerless to reduce the risk.

Lastly, structural/external factors that are related to economic insecurity are by many artisans seen as barriers to the prevention of OSH problems. A majority of the artisans feel powerless in facing these barriers; because they lack the means to overcome them. This result confirms previous studies that found that informal workers may not have sufficient resources to prevent OSH problems (Oranusi et al., 2014).

#### 4.2. Conclusion

Several conclusions can be drawn from this study.

First, the interviews revealed that artisans diverged in their views of what causes work-related OSH problems. Broadly speaking, they distinguish between work- and worker- related causes and other causes stemming from their cultural or religious views. These perceived causes are not mutually exclusive since many participants mentioned both types of causes.

All the artisans recognized that various aspects of their job could cause OSH problems. These included an unsafe workplace, work procedures, the equipment and materials they worked with, and their exposure to chemicals and injurious substances. Many also mentioned the worker himself as a potential cause of OSH problems, pointing, for example, to carelessness, lack of concentration, greediness, unsafe work practices, alcohol abuse, and lack of adequate knowledge of the task to be done.

More than half of the artisans also referred to religious and cultural factors as a cause of OSH problems. In their view, accidents may also be the result of God's will, preternatural forces, or destiny.

Secondly, only a minority of the artisans believed that OSH problems could be prevented. The perception of the preventability of OSH problems is related to the perceived causes. OSH problems caused by work- and worker-related factors are often considered preventable, while almost all OSH problems attributed to non-work-related (cultural and religious) factors are seen as not preventable. A third of the artisans mention actions like cleaning the work environment, not using dangerous materials, taking proper care of tools, and using personal protection equipment (PPE) as means to prevent injuries and illnesses. However, they also mention quite a few barriers to the prevention of these OSH problems.

As far as worker-related causes are concerned, some artisans admit that these could be prevented, for example, by taking more precautions, more concentration while working, working more carefully, improving personal competence, and not drinking while working.

Almost all workers that attribute OSH problems to God's will, destiny, or preternatural forces believe they are not preventable since they are beyond the worker's control. The only exception mentioned is that being truthful in dealing with customers is believed by some to help prevent accidents.

Thirdly, even though about a third of the artisans state that OSH problems can be prevented, they also mention three main types of barriers to prevention, namely barriers related to economic, work material, and external/structural factors.

As far as work-related factors are perceived as causes of OSH problems, some say that better equipment, less dangerous materials, and PPE are not available or too expensive, while some also question the effectiveness of PPE in their particular work. According to some, hazards are simply part of the job. Also, worker-related causes of OSH problems are not always perceived as preventable. Among the factors that might hinder prevention is that the workplaces are located along the road, that sucking petrol is the most efficient way of getting it out of a tank and that mistakes at work are simply inevitable. External or structural factors that can hinder prevention are, for example, irregularities in the electricity and petrol supply, the decrease in the number of youths learning

artisanal work, and the non-availability of suitable places for their work like a mechanic village.

Our results have several important implications for the prevention of OSH problems among informal workers in developing countries.

First, the large share of artisans who believe that OSH problems are not preventable means that the artisans must first be educated that most OSH problems can be prevented. This may be particularly difficult if artisans believe that OSH problems are an intrinsic part of their job or alternatively caused by cultural or religious factors beyond their control.

Secondly, part of the artisans are ignorant of the negative effects of unsafe work practices such as orally sucking petrol and working without PPEs. The belief that these behaviours are not harmful probably emanates from the fact that negative effects of such behaviour do not show up immediately (Ojo et al., 2017; Olsen et al., 2010; Hasle et al., 2009). Providing them with more information about the potential harmful effect, might help in reducing the incidence of OSH problems.

Thirdly, the literature often stressed that OSH problems are preventable if the exposure to hazards is reduced or eliminated (Hui-Nee, 2014). However, our study shows that it is essential to include the perception of the workers of the causes and the preventability of OSH problems in any prevention programme to be effective.

Furthermore, these findings may have great practical importance for OSH professionals, public health practitioners, and policymakers. For example, they might organize regular seminars and courses that inform the artisans about the dangers of not using PPEs and the deleterious effects of unsafe workplaces and work practices. The training should emphasize the role of the individual workers in preventing OSH problems, especially those that have to do with carelessness, lack of adequate knowledge of the work, drinking alcohol at work, and greediness. Adequate training might change their fatalistic belief about ill health at the workplace and encourage them to invest in OSH.

Lastly, policymakers might focus on those OSH problems that are beyond the control of the artisans. For example, they might provide mechanic villages that are equipped with basic amenities or make loans accessible to the artisans under less stringent conditions. This might help them in overcoming financial barriers for the procurement of expensive equipment.

#### 4.3. Limitations and future lines of research

This study has revealed the artisans' perception of OSH problems and their prevention. However, it should be noted that the interviews were conducted among a limited number of automobile artisans in Osun State, Nigeria, and therefore might not be generalized to other informal workers in other regions or countries. Having said this, the same mechanisms could still be relevant in other contexts. Therefore, future research might focus on other occupational groups in a different context.

A limitation of this study is that it is fully based on the artisans' perception and did not study the actual incidence and causes of OSH problems. Therefore, no direct relation can be established between the actual incidence and the real causes of these problems and the perception by the artisans. Consequently, we do not know which share of OSH problems is attributed by the artisans to the real causes. More insight into the relation between perception and actual causes would be necessary to determine the importance of misattribution by the workers. Future research may shed more light on this.

Lastly, this research did not study the origin of the beliefs and the artisans' perceptions. Although we related these to the Yoruba culture, future studies in other contexts might reveal how deeply embedded these beliefs are in the local culture and the potential for changing these beliefs.

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