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Awareness of Road Safety Signs

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Abstract

The purpose of this intervention programme was to close the awareness gap of road safety signs amongst commercial drivers in selected motor parks within the Benin metropolis in Edo State due to the continuous loss of lives on our roads annually. The pretest survey carried out showed a poor awareness of the meaning of road safety signs. Even the few commercial drivers that seemed to be aware of the existence of some of the signs did not respond adequately to the safety signs due to little or no commitment and support from stakeholders that included management, commuters and law enforcement officers. This highlighted that there was a need for an intervention programme to remove the lack of awareness knowledge gaps on road safety signs. The awareness intervention was centered on 20 selected road safety signs which are common on Nigerian roads. All participants were showed the various signs and their corresponding meanings. The requirement for responding adequately to road signs was explained to influence commercial drivers' self-efficacy on the road. As a follow-up to the intervention programme, A3 poster samples were presented to all 12 motor parks that participated in the programme, to help reinforce information to overcome the knowledge gaps covered during the educational programme.

Key words: Awareness, Road Safety signs, Commercial Drivers, Motor Parks.

Introduction

Over 1.2 million people die each year on the world's road, with millions more sustaining serious injuries and living with long-term adverse health consequences (World Health Organization WHO, 2009). WHO (2009) further asserted that globally, road traffic crashes are a leading cause of death among young people and the main cause of death among those aged 15-29 years. Road traffic injuries are currently estimated to be the ninth leading cause of death across all age groups globally, and are predicted to become the seventh leading cause of death by 2030 (WHO 2009). This rise is driven by the escalating death toll on roads in low- and middle-income countries – particularly in emerging economies where urbanization accompanies rapid economic growth.

Nigeria, with a total land area of 910,771 square kilometers and human population of more than 167 million, is the most populous country in Africa, and the 7th most populous nation in the world (Federal Road Safety Commission FRSC, 2012). Its large land mass and burgeoning population correlate with its high level of vehicular population estimated at over 7.6 million with a total road length of about 194,000 kilometers (comprising 34, 120 km federal, 30,500 Km, State and 129,580 km of local roads). Nigeria ranked as the country with the second largest road network in Africa in 2011. Its population density which varies in rural and urban areas (approximately 51.7% and 48.3% respectively) translates to a population - road ratio of 860 persons per square kilometers indicating intense traffic pressure on the available road network. This pressure contributes to the high road traffic crashes in the country (FRSC, 2012).

Nigeria continues to feature in the bottom half of World Health Organization country rankings of road traffic crashes. The country's 149th ranking in 2009 out of 178 member states indicates the hazards associated with road transportation in a country that is largely dependent on its road network for economic, social and physical activities. It is sad to know that news of road traffic crashes in Nigeria no longer stirs any shock. What may be shocking, however, is the degree of the fatality. Every day Nigerian Newspapers carry news of road traffic crashes that are considered weighty only in severity. Occasionally the papers sum up the number of lives claimed as if they were providing an expenditure account.

Traffic signs are the oldest and most commonly used Traffic Control Device (TCD). These signs convey messages in words or symbols to regulate, warn, or guide the road users (motorists and pedestrians etc.). Traffic signs are commonly used traffic safety tools, mainly developed to provide crucial information in a short time to support safe driving. Their success depends on their comprehensibility by the drivers (Kirmizioglu, & Tuydes-Yaman, 2012). Traffic Control Devices (TCDs) - traffic signs, pavement markings and

traffic signals- are a vital part of the road system. Of these three different types, traffic signs are the oldest and most frequently used traffic control devices currently in use. They provide a means of communicating important information about the roadway to the driver. Traffic signs utilize color, shape, symbols and/or words to convey information. However, the traffic signs cannot effectively serve their intended purposes if drivers do not understand the information concerning safe driving behaviour that is encoded in the signs (Stokes, Rys, Russell & Kerbs 1995). In fact, the American National Standard Institute (ANSI Z535.3) and the Organization of International Standardization (ISO 3864) advice that symbols must meet a criterion of at least 85% or 67% correct, respectively in a comprehension test to be considered acceptable "with believe that drivers should be able to have proper understanding to this posted traffic signs" (Al-Madani & Al-Janahi, 2002b; Wolff & Wogalter, 1998). Traffic control devices such as signs, signals, markings and other devices placed on or adjacent to a street or highway helps to regulate, warn and guide the traffic. Noncompliance of traffic regulations is one of the likely causes of road traffic crashes. This violation of regulations could be due to ignorance or purposeful negligence on the part of the driver. None the less, an understanding of driver behaviour in observing road safety signs is essential for reducing traffic problems and improving the existing infrastructure.

There is a general public perception that commercial drivers do not have a satisfactory level of awareness of road safety signs, and often, this is thought to be a major cause of road crashes. Consequently, this intervention programme was carried out to assess the awareness level of commercial drivers to road safety (traffic) signs in selected motor parks within Benin metropolis, in Edo State.

Objectives of intervention programme
The objective of the study was to design an intervention programme, which will improve the awareness and understanding of road safety signs by commercial drivers in selected motor parks, within Benin metropolis, Edo State, which will eventually lead to reduction of road traffic crashes on our roads.

Scope of the programme
The programme was carried out for a period of one academic session, from March 13 to November 13, 2017. During the period of the programme, the researcher worked two times in a week with the public relation office team designated to motor parks and other public places.

Activities carried out during programme
- Familiarization with the department
- Introduction of the researcher to managers and/or supervisors of commercial parks
- Orientation to objective of programme
- Public health talk
- Inference and findings from health talk
- Counseling and health education
- Follow-up messages
- Feedback from the participants

The researcher was given ample access to the commercial fleet drivers in the different motor parks selected.

The intervention programme
Driver's awareness of road safety signs were evaluated by conducting a survey amongst 143 commercial drivers in selected motor parks within Benin metropolis. In this study, "awareness" was assessed in terms of how well drivers correctly identify the safety-related messages encoded in certain road safety signs. A dichotomous survey type questionnaire (yes or no) for each road safety sign evaluated was prepared. In addition to the dichotomous survey type questionnaire, the survey form contained a brief introduction about the purpose of the study, and some specific queries regarding the respondents' demographic (name, sex, age, marital status and educational background) and driving characteristics like driving experience. The third section was designed to assess the comprehension of drivers' knowledge about traffic signs, traffic signal and road marking questions (Traffic Control Devices "TCDs").

Drivers Awareness of Road Safety Signs
Awareness of Warning Signs
Table one below shows the result of drivers' awareness of warning signs. A total of 9 warning signs were evaluated in this study. The average percentage of correct answers of these signs was 42.13% which indicated that the awareness was poor. The signs that were well understood by drivers were *Dangerous Bend Right,* 81.4%, *Narrow Bridge,* 79.6% and *Long Grade Dangerous Hill,* 67.2%. The least understood signs were *Railway Crossing without Gate,* 5.4%, *Carriage Way narrows,* 15.2% and *Double Dangerous Bend First to Right,* 20.3%.

Table 1: Awareness of Warning signs. [Adapted from Nigeria Highway Code – Road Users' Handbook (2016)]

Signs	Sign meaning	%
	Narrow bridge	79.6
	Dangerous bend right	81.4
	Double dangerous bend first to right	20.3
	Long grade dangerous hill	67.2
	Carriage way narrows	15.2
	Railway crossing without gate	5.4
	Pedestrian crossing	60.7
	C - Caution	60.1
	Intersection with major road	40.3

Table 2: Awareness of Regulatory signs.
[Adapted from Nigeria Highway Code – Road Users' Handbook (2016)]

Signs	Meaning of signs	%
	Speed limit 100km/h	98.6
	No parking	50.3
	No overtaking	20.2
	No bus allowed	15.8
	No U turn	60.4

Awareness of Informative Signs

A total of 3 informative signs were assessed and the result is shown in table 3. The average awareness level of these signs was 66.6% indicating relatively poor to average awareness. The signs well understood were *Roundabout,* 90.6%, and *Advance Direction,* 78.8%.

Awareness of Regulatory Signs

A total of 5 regulatory signs were evaluated with the result presented in table 2. The average percentage of the correct answer was 49.06%, which showed that the awareness was very poor. These signs were largely understood *Speed limit,* 98.6%, and *No U Turn,* 60.4%, while *No Bus Allowed,* 15.8% and *No Overtaking,* 20.2% were the least understood sign.

Table 3: Awareness of Informative signs.
Adapted from Nigeria Highway Code – Road Users' Handbook (2016)]

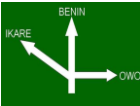| Signs	Meaning of signs	%
	Advance direction	78.8
	Hospital	30.4
	Roundabout	90.6

Table 4: Awareness of Road Traffic markings. [Adapted from Nigeria Highway Code – Road Users' Handbook (2016)]

Signs	Meaning of signs	%
	Continuous Lane Line (do not cross)	25.3
	Broken Lane Line (you may cross if it is safe to do so)	25.3

Drivers Awareness of Traffic Markings
Table four shows the result of drivers' awareness of road traffic markings. A total of 2 road traffic markings were evaluated and the average percentage of correct answer was 25.3% which indicated that the awareness was very poor.

Traffic Light Signals Awareness
The meaning of three traffic signal indications that is Red, Amber and Green were tested in this survey and the awareness levels for the three signal indications is presented in table five. The average percentage of correct answer of these three signal indication was 92.9% which shows that the awareness rate was very good. All the three traffic signal indications - red, amber and green were well understood.

Table 5: Awareness of Traffic Light Signals.
[Adapted from Nigeria Highway Code – Road Users' Handbook (2016)]

Signs		Meaning of signs	%
		RED means STOP! (come to a complete stop)	96.2
		AMBER means Ready to MOVE or STOP	92.3
		GREEN means you may go ahead or turn with care	90.1

Drivers' responses were further analyzed to see if their personal and driving characteristics have any effect on their responses. Only the educational background, age and years of experience of the drivers had influenced the responses. The drivers with a Bachelor of Science and Higher National Diploma (HND) understood traffic signs more than the drivers with West African Examination Council (WAEC) and Ordinary National Diploma (OND). Drivers aged 26-30 years old and 30-35 had a better understanding of traffic signs than younger drivers. Drivers with driving experience of 6-10 years and 10 years and above comprehend traffic signs more easily and better than those with 1-5years experience.

Intervention strategy
The researcher made 2 (two) coloured roller flex banners, containing 20 (twenty) road safety signs that were evaluated in this survey. This was done, to mirror the exact size, colour and shapes of each signs. One was unnamed, and the other was named. See figures 1 and 2.

The intervention sessions were insightful for the commercial drivers in each motor park and their management. All assumptions and uncertainties were eliminated as the awareness level of each driver that participated increased tremendously in understanding what each of the signs meant and they were able to make an appropriate response to each sign when they come across this sign on the side of the road.

Figure 1 Road Safety Signs [Adapted from Nigeria Highway Code – Road Users' Handbook (2016)]

Figure 2. Traffic Signs [Adapted from Nigeria Highway Code – Road Users' Handbook (2016)]

Evaluation of the programme

The intervention programme was a huge success as a noticeable improvement in understanding was made in the participants. This was also seen in the post-test survey retrieved from the participants. The percentage increase of understanding all of the road safety signs used for the intervention programme showed between 95.5% to 100% awareness on the signs evaluated in the post intervention test. Post-test participants demonstrated an understanding of the reason behind the installation of these signs on roads as being to guide, regulate and warn all road users of different road conditions. All these signs are preventative measures put in place to facilitate a good driving culture and reduce Road Traffic Crashes (RTCs) on roads. As a follow up to the intervention programme, and further reinforcement of what was learnt, the researcher made available twelve A3 size posters, containing named and unnamed road safety signs and/or Traffic Control Devices (TCDs), to the 12 selected participating motor parks at the end of the programme to serve as a refresher tool for commercial drivers during their weekly tool box meeting at each motor park.

Conclusions

The awareness of road safety signs by commercial drivers is an important factor in order to maximize safety on our roads. Road safety signs as a means of communication, are installed and used to provide necessary information about our road and the environment to all road users, including commercial drivers. The result of the programme shows that generally, commercial drivers had a poor awareness of the meaning of road safety signs. This could be attributed to the educational background of commercial drivers, since 90.21% of them only had either Primary School Certificate or Secondary School Certificate. From the post survey research participants' responses, it was determined that targeted education had a significant effect on the awareness of commercial drivers of the meaning of road safety signs. This outcome is in line with other research findings (Makinde, & Oluwasegunfunmi, 2014) that commercial drivers generally have poor understanding of road safety signs.

Recommendations

The following recommendations are made based on the outcome of the intervention programme.

More awareness campaigns, or intervention programmes of this sort, should be carried out on a regular basis by concerned government agencies or stakeholders, to motor parks to increase the awareness of road safety signs amongst commercial drivers.

IEC (Information, Education Communication) materials, such as posters, use of public media like radio and television, seminars etc. should be tools used in creating periodic awareness to motor parks.

Agencies of government such as Federal Road Safety Commission (FRSC), Nigeria Police -Motor and Traffic Division (NP-MTD) and Edo State Traffic Control and Management Agency (EDSTMA) should be more strategic in their approach, to equipping commercial drivers with all the educational materials mentioned above.

Road traffic agencies in Benin Metropolis should enhance the enforcement of traffic rules on all routes.

Road traffic agencies and affiliates saddled with the responsibilities of issuing the national driver's license for new drivers to drive on our roads, should ensure that a distinction in road safety signs, is a prerequisite to issuing the license to drivers.

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Improving Awareness and Understanding of Pre-eclampsia Among Pregnant Women

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Abstract

This article describes an intervention programme carried out to improve awareness and create adequate understanding of Pre-eclampsia among Pregnant women attending Ugbekun Health Centre, in the Ikpoba Okha Local Government Area of Edo State, Nigeria. Pre-eclampsia is a condition characterized by high blood pressure, protein in the urine, and swelling of the hands and face that occurs after 20 weeks of pregnancy. It occurs in about 10 to 15% of pregnancies and is more common with the first pregnancy, in teenagers, and in women over 35yrs. While it can occur in the late second trimester, pre-eclampsia is much more common in the third trimester, near term. Pre-eclampsia can lead to eclampsia (seizures), kidney failure, and rarely to death in the mother and fetus. An assessment was carried out in the antenatal clinic to ascertain the awareness and level of understanding of Pre-eclampsia among pregnant women revealed that they knew little or no information about Pre-eclampsia, its complications, early signs and prevention. This signified a need to close the gap in this regard. Following this assessment an intervention programme was conducted in a health center to provide an understanding of the pregnant women and to be able to encourage them to get medical help at the health center; rather than patronizing quacks. The pregnant women were educated, provided with information about the signs of Pre-eclampsia and the need for regular checks of their blood pressure, having a urine test to check for protein and to report any unusual signs and symptoms observed while they were pregnant. As a follow-up to the intervention programme, all pregnant women attending antenatal clinic within the period of this study were tested for signs of hypertension, proteinuria and excessive weight gain to help emphasise the information and to overcome the knowledge gaps covered in the educational programme.

Key words: Pre-eclampsia. Pregnancy induced hypertension. Pregnant women.

Introduction

Pre-eclampsia is a condition characterized by high blood pressure, protein in the urine, and swelling of the hands and face that occurs after 20 weeks of pregnancy. It occurs in about 10 to 15% of pregnancies and is more common with the first pregnancy, in teenagers and in women over 35years old. While it can occur in the late second trimester, pre-eclampsia is much more common in the third trimester, near term. Pre-eclampsia can lead to eclampsia (seizures), kidney failure, and rarely death in the mother and fetus (Healthline, 2015).

Despite years of scientific study, the true cause of pre-eclampsia is not known, nor is there any effective prevention. The cure, however, has been known for many decades, and that is delivery of the baby. For that reason, timely diagnosis and delivery is the best way to avoid serious problems for the mother and for the fetus (Healthline, 2015).

Maternal mortality, also known as maternal death, continues to be the major cause of death among women of reproductive age in many countries and remains a serious public health issue especially in developing countries (WHO, 2007). As explained in Shah and Say (2007), a maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to, or aggravated by, the pregnancy or its management but not from accidental or incidental causes. During pregnancy every mother must be very careful about hers and her baby's health. This is called prenatal care of the baby and the mother. Studies have shown that mothers who have good prenatal care have the healthiest babies. They also have less chance of medical problems when they are pregnant. To take care of the mother and her baby a knowledge of various factors is required (Ferguson & Nokes, 2015).

The World Health Organization (WHO) Factsheet (2008) indicates that globally about 80 percent of maternal deaths are due to four major causes – (1) severe bleeding, (2) infections, (3) hypertensive disorders in pregnancy (pre-eclampsia) and (4) obstructed labor. Antenatal care can help women prepare for delivery and understand warning signs of health problems during pregnancy and childbirth. Education required can be a source of micronutrient supplementation, treatment of hypertension to prevent eclampsia, immunization against tetanus, HIV testing, in addition to medications to prevent mother-to-child transmission of HIV in cases of HIV-positive pregnant women (UNICEF, 2017).

Pre-eclampsia and eclampsia - pregnancy-related

hypertensive disorders, are consistently cited as a leading cause of maternal morbidity and mortality in Nigeria. In addition to maternal morbidity and mortality, Pre-eclampsia can increase the likelihood of preterm or stillbirth (Onyearugha & Ugboma 2012; Olusanya & Solanke, 2012); Owolabi, Kuti, Adeyemi, Faturoti and Obiajuwa (2008). Both Pre-clampsia and Eclampsia are preventable and the deaths due to Pre-eclampsia can be avoided through timely detection and management of complications during and after pregnancy (The World Health Organization, 2011).

Nigeria is Africa's most populous nation of about 162.5 million people. The Nigerian health system divides hospitals into primary, secondary, and tertiary hospitals with referral linkages between them (Tukur, Umar & Rabiu, 2009). In addition, Nigeria divides levels of governance into three distinct and independent entities, that are: federal, state, and local governments. The tertiary healthcare systems are managed by the federal government, the secondary institutions by the state government and the primary health care by the local government authorities, with no formal connection between these levels of care (Tukur, Umar & Rabiu, 2009). Patients with Pre-eclampsia and eclampsia are often referred from primary to secondary and tertiary health facilities for management. Delays in care are common due to lack of knowledge of the patient, poor understanding of the seriousness of the condition, as well as differing governance structures in the healthcare system.

Despite significant declines in maternal mortality rates, sub-Saharan Africa continues to face the burden of maternal deaths due to pregnancy related complications. Nigeria is one of the ten most dangerous countries for a woman giving birth and is reportedly responsible for 14% of the world's maternal deaths (National Population Commission [Nigeria] & ICF International, 2014). Pre-eclampsia stands out among the hypertensive disorders for its impact on maternal and neonatal health. It is one of the leading causes of maternal and perinatal mortality and morbidity worldwide. However, the pathogenesis of pre-eclampsia is only partially understood and it is related to disturbances in placentation at the beginning of pregnancy, followed by generalized inflammation and progressive endothelial damage (WHO, 2011).

Diagnosing pre-eclampsia and managing it before it progresses to severe pre-eclampsia or eclampsia is a critical strategy to promote positive maternal and newborn health. Pre-eclampsia can be managed and eclampsia can be prevented by routine screening of blood pressure and protein levels in urine for pregnant women during antenatal care visits (WHO, 2011). Eclampsia is characterized by the occurrence of generalized seizures in women with pre-eclampsia, provided that the tonic–clonic seizures are not attributable to other causes (e.g. epilepsy). (Steegers, von Dadelszen, Duvekot & Pijnenborg, 2010; WHO, 2005).

Obesity, chronic hypertension and diabetes are among the risk factors for pre-eclampsia, which also include nulliparity, adolescent pregnancy and conditions leading to hyper-placentation and large placentas (e.g. twin pregnancy). Pre-eclampsia is usually classified as mild or severe. In most settings, pre-eclampsia is classified as severe when any of the following conditions is present: severe hypertension, heavy proteinuria or substantial maternal organ dysfunction. (WHO, 2011).

The World Health Organization (WHO) recommends three main evidence-based approaches to prevent maternal mortality due to Pre-eclampsia:
1). Preventing the incidence of Pre-eclampsia by screening all pregnant women for signs and symptoms during antenatal care check-ups. Preventative interventions include: calcium supplementation during pregnancy, low-dose aspirin prophylaxis and family planning methods to delay pregnancies in teenage girls.
2). Detecting early signs of Pre-eclampsia by measuring blood pressure and protein levels in the urine during antenatal care visits to monitor and manage pre-eclampsia.
3). Managing severe cases of Pre-eclmapsia by administering anti-convulsion therapy - magnesium sulphate (MgSO4) - to stop seizures followed by careful monitoring of the pregnant mother and her fetus and to plan a timed delivery of the baby (The World Health Organization, 2011).

In Nigeria, approximately 34% of pregnant women receive no antenatal care, putting them at higher risk of maternal mortality (NPC & ICF International, 2014). A recent, nationwide cross-sectional survey found that pre-eclampsia and eclampsia is the leading cause of maternal mortality in Nigeria and is responsible for 28.2% of maternal deaths; the other main contributors to maternal mortality are hemorrhage (24.4%) and pregnancy-related infection/sepsis (14.2%) (Oladapo, Adetoro, Ekele, Chama, Etuk, Aboyeji, & Gülmezoglu, 2015).

Nigeria has high maternal and infant mortality. In recent years, the country has embarked on measures to reform the healthcare system, including Maternal Healthcare (MHC) delivery, in a bid to attain Millennium Development Goals (MDGs) 4 and 5. Most health reform efforts have been geared towards increasing availability of

healthcare services, without commensurate increase in quality. Studies have shown that increased availability of service does not always translate to increased access to healthcare (Osariemen, 2011); World Bank, (2001). Hence, for these interventions to deliver optimally there is need to ensure that quality of service is taken into consideration in the provision of Maternal Health (MH) services.

Intervention programme objective
The objective of the study was to design an intervention programme that will help improve awareness and understanding of Pre-eclampsia among pregnant women of Ugbekun Health Centre, Ikpoba-Okha Local Government Area, Edo State, which will eventually lead to reduction of pregnancy related complications before, during and after delivery. The specific objectives set to achieve the identified goal were as follows:
a. to work closely with the health personnel on ground to assess their previous efforts towards improving awareness and understanding of Pre-eclampsia in the health center;
b. to appraise the attitudes of pregnant women towards some vital signs of Pre-eclampsia hence, early antenatal registration;
c. to educate the pregnant women on the need to utilize laboratory services;
d. to sensitize and educate the pregnant women on the need for prompt treatment of signs associated with pre-eclampsia to avoid further complications.

Scope of the programme
The intervention programme was carried out for a period of one academic session, from March to November, 2017. During this period, the researcher worked two days in a week (antenatal clinic days) with the health personnel designated to the antenatal clinic of the health center.

Activities carried out during the programme
- Familiarization with various departments of the health center
- Introduction of the researcher to the staff of the health center
- Orientation to the objective of this programme
- Public health talk
- Checked the blood pressure of the pregnant women
- Tested the urine of the pregnant women urine for the presence of protein using urine test kit
- Counseling and health education

The researcher was given ample time to educate the women

The Intervention programme
The intervention programme to improve awareness and understanding of Pre-eclampsia also known as pregnancy induced hypertension among pregnant women in Ugbekun Health Centre, Ikpoba Okha Local Government Area, Idogbo, Edo State. The researcher having been assimilated to the Health Centre, reviewed records relating to antenatal. The records files included: treatment file (individual file containing information about the patient's medical history. This file also indicated personal information about the holder.) Referral file: (contained information on pregnant women referred to bigger hospitals due to complications). Laboratory test record: (laboratory result test records of the pregnant women.). The researcher had the opportunity to talk one on one with the pregnant women to ascertain their thoughts, knowledge and beliefs about pre-eclampsia; and was also able to make some observations on how the health personnel and the pregnant women interacted with each other and whether the right information was being passed to the women.

The researcher through investigations was able to observe among others, the following problems:
1) There was inadequate health educators to sensitize the pregnant women;
2) Records revealed that some pregnant women do not register early for antenatal, while some register but do not attend ante natal. They deem it fit to register/attend antenatal when they are having unusual pains;
3) Some of the pregnant women had not received prior information on pre-eclampsia, hence any complications identified were referred to a central hospital;
4) Some of the pregnant women were not aware of the importance of laboratory test especially packed cell volume, Urinalysis, Hepatitis A and Blood group.

Intervention components
Assessment: In the assessment of the previous efforts towards improving the awareness and understanding of pre-eclmapsia, the researcher sought to find answers to the following salient questions:
i. Do pregnant women know the importance and reason why they should keep to their antenatal date?
ii. Do pregnant women know the reason why they should carry out routine laboratory test and medical check-up?
iii. Do the pregnant women have knowledge of the complications of pre-eclampsia?
iv. Do the pregnant women know the importance of early detection of signs and symptoms of pre-eclampsia?

Implementation: The second component of the intervention programme is the implementation of activities designed as a result of the information

gathered from the assessment. The activities include:

i. Checking the pregnant women personal treatment file to ascertain their medical condition and follow up;

ii. Carry out routine examination of their blood pressure and urinalysis (urine dip stick test);

iii. Giving health talk to the pregnant women on awareness and understanding of the signs of preeclampsia;

iv. Sensitizing the pregnant women (new and old) on the need to carry out laboratory test with emphasis on urinalysis.

Evaluation: Evaluation was the last component of the programme. In order to ensure effective outcome from the implementation, three forms of evaluation were employed thus:

i. Formative Evaluation: The intervention programme was evaluated at the implementation state in order to ensure that the activities being implemented are in line with the objectives

ii. Process Evaluation: The intervention programme was evaluated while the intervention programme was taking place to improve the quality and delivery of the intervention programme.

iii. Summative Evaluation: At the end of the intervention programme, another form of evaluation was carried out to find out if the activities implemented were able to realize the stated objectives

Implementation Plan

The researcher planned the intervention to span through a period of three weeks and to comprise:
- Design of posters and handbills
- Health talk on Pre-eclampsia with emphasis on early registration, giving to next appointment, reporting of any signs and symptoms observed, carrying out of routine medical test and adequate diet and rest.
- Routine checking of blood pressure
- Free urine dip stick test for the three weeks
- One on one counselling and follow up

Health Talk

The researcher was given the platform to give health talk to the women every antenatal day. The researcher explained the signs of Pre-eclampsia to them which include: stomach pain, swelling of the feet, hands and face, difficulty in breath, severe headache and a nauseous feeling. Importance of routine tests during pregnancy was also mentioned to the women, risk factors associated with Pre-eclampsia was highlighted and the management of Pre-clampsia or related signs was highlighted to the women. The researcher also emphasized on adequate nutrition of diet as what a woman eats during pregnancy is the major bedrock of her wellbeing.

Urine Dipstick test for Protein

In view of cost and effect of urine test to screen for the presence of protein, the researcher decided to give out free urine dipstick screening for proteinuria. The women availed themselves this opportunity and responded willingly. At the end of the screening exercise, the following analysis was recorded:

Total number of women screened: 211
Number of women with a trace of protein: 3
Number of women with protein: 32
Number of women without protein: 176.

Those whose urine had protein, or a trace of it, were counselled for further urinalysis microscopy and culturing to ascertain the cause and to know the appropriate antibiotic to administer to them.

Proteinuria occurs in pre-eclampsia as a consequence of reduction in the integrity of glomerular barrier or reduced tubular reabsorption. It remains an important objective criterion for diagnosis of pre-eclampsia and has been used to classify the severity as well as to predict adverse fetomaternal outcome in pre-eclampsia. (Cunningham, Leveno, Bloom, Hauth, Rouse & Spong, 2010).

Checking of Blood Pressure

The researcher then checked the blood pressure of the women who came for antenatal care. A sphygmomanometer was used which consisted of an inflatable rubber cuff that is applied to the arm and connected to a column mercury next to a graduated scale, enabling the determination of systolic and diastolic blood pressure by increasing and gradually releasing the pressure in the cuff. A stethoscope is used to listen to arterial blood flow sounds. As the heart beats, blood forced through the arteries causes a rise in pressure, called systolic pressure followed by a decrease in pressure as the heart's ventricles prepares for another beat. This low pressure is called the diastolic pressure. The researcher enlightened the women on the normal blood pressure which should not exceed 140mmHg over 90mmHg (systolic and diastolic respectively). Those women whose readings were above these figures were interviewed and counselled on what to do to maintain the normal range of blood pressure in pregnancy.

The researcher decided to utilize the Health Belief and Information Motivation Based models for this study to improve the awareness and understanding of Pre-eclampsia among pregnant women attending Ugbekun health center because the women need to be enlightened to have a change of behavior. The researcher observed that the women before now were not adequately informed on the complications of Pre-eclampsia, their motivation levels were low and they lacked some core behavioral skills to adhere to

information given. After due consideration, to further help the women change their behavior, the researcher utilized the construes of the Health Belief Model to broaden their awareness and understanding of Pre-eclampsia and its complications.

Programme Evaluation

Considering the time frame of the study, a long term evaluation could not be ascertained. However, the researcher visit the health center, checked the referral and the laboratory record files, it was discovered that the number of women requesting for laboratory test (urine test) increased and for the time being, no pregnant woman has been referred to bigger hospitals, some of the women due for delivery, delivered successfully. The researcher also met some of the women whose expected date of delivery is yet to come to ascertain their compliance and status, and discovered also that they are complying and their health is in good state. The researcher also observed that, some of the women invited other pregnant women with the handbills given to them, and this increased the number of antenatal women attending the health center.

Summary

The intervention programme to improve the awareness and understanding of Pre-eclampsia among pregnant women attending Ugbekun health centre, Ikpoba-okha Local Government Area, Edo State. The researcher identified four problems needing intervention, which among others include: some of the pregnant women had not been sensitized on pre-eclampsia and do not understand the importance of medical test/screening during pregnancy. Four objectives were formulated to guide intervention of the programme. The Information, Motivation, Behavioral Skills and Health Belief Models were used as a theoretical framework to guide the implementation of activities needed to change behaviour. After evaluation, the researcher found out that the intervention programme was successful.

Conclusion

Nigeria has high maternal and infant mortality despite measures embarked to reform the healthcare system, in a bid to attain Millennium Development Goals (MDGs). Most of these health reform efforts have been geared towards increasing availability of healthcare services, without commensurate increase in quality. It is the opinion of the researcher that if quality health service reformed is adhered to, in all levels of health delivery: Tertiary, Secondary and Primary; it will increase the populace access to healthcare. The researcher observed that one of the reasons why there is a recurrent occurrence of maternal and infant mortality due to pre-eclampsia is the fact that quality health services has not reached the grass-root people and, out of ignorant, people in the rural communities tend to seek healthcare service from cheap and untrained providers. Pre-eclampsia is a medical problem posed with protein in urine, rise in blood pressure and edema, and only quality healthcare services can ameliorate its danger among pregnant women.

Recommendations

To improve future interventions into awareness and understanding of Pre-eclampsia among pregnant women, the following recommendations were drawn:

- The local government should employ more health workers to sensitize pregnant women.
- These health workers should be adequately trained on every facts and facet of antenatal care, likely causes of maternal/infant mortality, its treatment & preventive management so that they can be able to provide the right information to the women.
- There should be more government sponsored sensitization and health talks on pregnancy induced hypertension on radios, televisions, churches, mosques, and so on.
- Nigerian government should support and collaborate with pre-eclampsia foundation for a synergy in bringing hope and succor to affected pregnant women.
- The state government should however equip primary healthcare centers with necessary facility and up to date facility to enhance prompt attention given to emergency situations.
- Religious bodies should not spiritualize pre-eclampsia related complications in pregnancy as handiwork of the devil but should periodically admonish their pregnant women on doing the needful.
- The medical and nursing staff should try to communicate to the women in language they can understand, and should be patient with the women.

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PPP: Enabling New Financing Avenues
For Transport Infrastructures In Lebanon

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Abstract

Lebanon used to have one of the most advanced public transport systems in the Middle East, embracing efficient bus, tram and train services. Unfortunately, however, fraternal infighting that ripped through the material and social fabric of the country during the civil war (1975-1990) also laid waste to its sophisticated public transport network. Revitalizing public transport in Lebanon is very much on the agenda, and several steps are being undertaken towards making it a reality.

This article looks at a number of aspects of the new Public-Private Partnership law of Lebanon, which is aimed at attracting private investments in transport infrastructures, thus easing the financial burden on the government of Lebanon, which is already faced with a high public debt and fiscal imbalances.

Introduction

The public transportation sector bloomed in Lebanon up until the 1975 outbreak of the civil war. The famous Tramway of Beirut, in collaboration with Electricité du Liban, served as a connection between several districts, neighbourhoods and areas of Beirut and operated efficiently. However, in the early 1960s, the tramway's infrastructure was dismantled and replaced by buses that functioned efficiently as well – taking only a couple of minutes to get from one district in Beirut to another. Therefore, roads in pre-war Lebanon were competently managed, and public transportation served as an important linkage between various destinations.

The transportation system in Lebanon suffered greatly from the consequences of the civil war. It suffered from a widespread destruction of the railway lines and public transport buses. During that time, public buses were bought from France, as a second attempt at effective public transportation, but were partially bombed during the 1982 Israeli invasion. By the final years of the war, these buses were almost all destroyed. Today, almost 29 years after the end of the war, there is still no substantial public transportation system that operates in the country.

This article sheds the light on the new

Public-Private Partnership law of Lebanon, which is aimed at attracting private investments in transport infrastructures.

Background

Lebanon suffers from severe congestion conditions due to years of neglect, a lack of urban planning and major investments in basic infrastructure. Furthermore, in the absence of alternatives, such as a comprehensive national public transportation system or railway services, the current fleet of transportation means is largely dominated by private vehicles, which account for more than 86% of the entire fleet (Economic Research Unit Credit Libanais, 2018).

Daily entrant vehicles to Beirut via the Northern Highway are estimated at 300,000 according to the World Bank, while around 200,000 and 150,000 vehicles arrive via the Southern and Eastern axes, respectively, per workday. Moreover, the vehicle stock in Lebanon has been significantly growing over the years. For instance, the total number of vehicles circulating across the road network in 1997 was almost 783,000 at a time when the population was 3.1 million, or 0.25 vehicles per capita; In 2015, an estimated 1.4 million vehicles are registered, against a total population of 5.85 million (including Syrian refugees), or the equivalence of 0.24 vehicles per capita (a ratio which would rise to 0.32 should Syrian refugees be excluded) (Economic Research Unit Credit Libanais, 2018).

To further aggravate the situation, the Syrian refugee crisis has imposed large burdens at social, environmental, political and economic levels, most tangible of which can be spotted on the level of the country's already decaying infrastructure. Lebanon's traffic problem imposes heavy burdens and large direct and indirect costs on the country's economy, setting huge constraints on its growth prospects and hindering it from realizing its potential. Overall, various studies conducted by Lebanese ministries and other international organizations estimate that the economic cost of traffic in Lebanon ranges between 5% and 10% of its Gross Domestic Product (GDP), a ratio that is considered very high when compared to other nations, according to the World Bank (Invest in Lebanon, 2018).

These costs along with associated opportunity costs display themselves on various levels, such

as: trade and transport of goods and services, transportation costs (whereby surveys indicate that, generally-speaking, transportation costs constitute an estimated 15% of a regular Lebanese household's total expenditures, a share that is extensively high when compared to peers in the region), the tragedy of commuting, road safety (whereby the World Health Organization's (WHO) *Global Status Report on Road Safety 2015* estimated road traffic fatalities at 1,088 in 2015 and a GDP loss due to road traffic crashes between 3.2% and 4.8%, which is higher than most countries around the globe), and investment (World Health Organization, 2015)

Besides the many negative effects that traffic conditions and the state of the transportation sector have on the Lebanese economy, there exist additional significant repercussions as well on the country's environment. According to a study conducted by the Ministry of Environment (MoE), in collaboration with the United Nations Development Programme (UNDP) and the Global Environment Facility (GEF), the transport sector contributes highly to air pollution, accounting alone for over 40% of the national oil consumption and almost 23.6% of the total Greenhouse Gas (GHGs) emissions in Lebanon (Economic Research Unit Credit Libanais, 2018)

Besides the development of an efficient public transportation system to combat traffic congestion and air pollution, improving the quality of roads in Lebanon is essential. While most of the existing projects either rely on foreign funding or increasing fiscal spending, the participation of the Lebanese private sector can reduce the financial burdens of the public sector and provide high-quality investments. In fact, public private partnership (PPP) projects to upgrade Lebanon's transport system and its main road network tend to be more successful as they combine the expertise and resources of both the public and private sectors. In this respect, Built to Operate (BOT) has been considered as one of the most common practices in infrastructure projects using private funding.

'Public Private Partnership Law' – Enabling New Financing Avenues for Transport Infrastructure

On 15 August 2017, the Parliament of Lebanon passed the *Public-Private Partnership law – the PPP Law.* It defines *PPP Projects* as projects of public interest, in which the private sector participates through financing and administration, and carries out at least one of the following activities: designing, building, developing, restoring, equipping, maintaining, rehabilitating and/or operating a project. It governs all partnership projects that are and will be prepared by the government, public administrations, municipalities, as well as unions of municipalities. Thus, it is applicable to all government and municipality projects, including transport infrastructures.

The PPP Law details the tendering mechanism for PPP Projects, including the general institutional framework. It calls for the creation of a project committee and assisting working teams for each project, as well as a structure that ensures the involvement of all stakeholders, in order to enhance the transparency of the tendering process, as well as that of the Private Partner selection. The PPP Law also details the main elements of the PPP Project Agreement that will be part of the tender documents and include, amongst others, available dispute settlement mechanisms.

In summary, the PPP Law sets out the following key provisions (Choueiri, 2018; High Council for Privatization and PPP, 2018; Fransa Invest Bank Research, 2017).

- the Higher Council for Privatization and Partnership (HCPP) of Lebanon will be the authorized entity for approving, launching and managing PPP projects, and will act as the liaison between the private sector and government bodies. A regulatory authority will be established for each respective sector to issue, renew and terminate licenses. The authority will also approve service charges and impose fines;
- PPP projects will be proposed by the Higher Council for Privatization and Partnership (HCPP), or the ministry concerned. The HCPP should study the projects and then submit a report explaining the feasibility of executing the project using the PPP vehicle. The mutual (PPP) projects are then referred to the Council of Ministers for approval. Projects that concern municipalities or unions are referred by the Mayor to the HCPP. For each project, the HCPP invites interested companies to participate in a prequalification round. The number of final bidding participants should be at least three;
- the Higher Council for Privatization and Partnership (HCPP) is required to prepare terms of reference and to conduct consultations with the participants and funding parties, in order to establish the technical and financial requirements for implementing the mutual project, and amends the terms of reference draft according to their outcome. Private partners are not allowed to sell their company shares before the start of the operational phase of the project. The government can be a partner in the company that is established for a mutual project – the government will then be represented on the

Board of Directors of this company by one of its members;

- the contracts are to be signed by the representative of the company and the respective public authority concerned. The partnership contract should include: the funding process, the contract duration (which should not exceed 35 years), and the revenue allocation of the project. It should also include the fines, commissions and fees related to the project, and the risks involved for both parties;
- the government will be controlling the project implementation during the establishment and operational phases. The government has the ability to provide state-owned land to the company. The company established for a specific project can benefit from incentives provided by the Investment Development Authority of Lebanon (IDAL).

The scope of application of the PPP Law extends, de jure, to all PPP Projects that are carried out by the State, public institutions, or any entity considered as 'public'. This includes without limitation all PPP Projects provided for under the laws governing telecommunications, electricity and civil aviation sectors. Such scope may also be extended to PPP Projects carried out by municipalities and unions of municipalities, provided certain conditions set out in the PPP Law are complied with.

Relevant authorities – Higher Council for Privatization and Partnership (HCPP), and the PPP Project Committee

The PPP Law stipulates that the Higher Council for Privatization and Partnership (HCPP) has the authority to:

- assess and evaluate potential PPP Projects submitted to it by its President or by relevant ministers;
- decide on the pre-qualification outcome and approve the final version of the tender documents following consultation with the pre-qualified bidders;
- establish a PPP Project Committee for every approved PPP Project;
- confirm the winning bidder who submits the best offer, based on the evaluation of the PPP Project Committee.

Thus, the PPP Law calls for the establishment of PPP Project Committees by HCPP, presided by its HCPP Secretary General and its members to include representatives of the Ministry of Finance, of other relevant ministries and, where applicable, the commission regulating the relevant sector. The PPP Project Committee is in charge of preparing an all-encompassing study governing the technical, economical, legal and financial aspects of PPP Projects, including the pre-qualification criteria, assessment of investors'

interest and the likelihood of attracting the required financing. It is aided in its functions by a team of financial, legal and technical consultants.

The Higher Council for Privatization and Partnership (HCPP) examines the studies and recommendations of the PPP Project Committee and determines whether to reject or to pursue the project. In the latter case, the Prime Minister submits the project to the Council of Ministers for approval. In case the project is approved by the Council of Ministers, the PPP Project Committee launches the process of selecting a private partner.

The PPP Project Committee

In addition to the duties outlined above, the PPP Project Committee is also in charge of:

- managing and administering the pre-qualification application process;
- evaluating the pre-qualification applications and providing its recommendations in relation thereto, and in relation to the PPP Project in general, to the Higher Council for Privatization and Partnership (HCPP);
- preparing and sharing the draft tender documents with the pre-qualified candidates, which includes a draft of the Project Agreement and its annexes;
- consulting with all pre-qualified candidates and lenders in a transparent and neutral manner, in order to reach a comprehensive and final delineation of technical requirements, the technical means and the financial structure most suitable for the project; the PPP Law provides that the draft tender documents may be amended in light of these consultations;
- sharing the final tender documents with the pre-qualified candidates;
- examining and evaluating the submitted bids and making recommendations in respect thereto to the Higher Council for Privatization and Partnership (HCPP);
- negotiating with the best bidder to improve the technical aspects of the bid, if mandated to do so by the Higher Council for Privatization and Partnership (HCPP);
- announcing the tender results that identify the successful 'private partner' and notifying the non-successful bidders of the reasons why their bids were not retained.

With respect to the latter point, it should be noted that the selected private partner is required to incorporate a Lebanese joint stock company – the PPP Project Company, which will be in charge of executing the PPP Project.

PPP Project Agreement

One of the key features of the PPP Law is that it

defines the "PPP Project Agreement" as being the main PPP contract together with all annexes, undertakings and guarantees related thereto that govern the contractual relationship between the respective public entity, the project company and all other third parties, including international financial institutions and foreign investors.

The PPP Law outlines that the following key provisions should be included in the PPP Project Agreement, and should also be part of the tender documents:

- the rights and obligations of the respective parties;
- the basis for financing the PPP Project;
- the duration of the partnership, which should not exceed 35 years;
- the respective revenues to be received by the project company from the public entity, or by the public entity from the project company, depending on the nature of the respective mutual project, as well as the corresponding means of payment;
- the fees and dues that the project company can collect on behalf of the public authority;
- the key performance indicators;
- the reports to be submitted by the project company;
- the allocation of project risks and mitigation measures;
- the rules governing the potential amendment of the basic terms of the contract;
- the guarantees, undertakings and commitments that may be provided for the fulfillment of the respective PPP Project;
- the public assets put at the disposal of the project company;
- the transfer procedures, whenever it is called for by the nature of the respective PPP Project;
- the procedures guaranteeing the continuity of the respective PPP Project and its related operations upon termination or expiry of the Project Agreement or breach of its contractual obligations;
- the procedures and remedies that would apply in case of breach of contractual obligations, as well as detailed enforcement procedures as regards these remedies;
- the mechanism for dispute settlement, including mediation, as well as domestic and international arbitration.

The PPP Law – Commentary

The PPP Law clearly defines the procedures for the parties involved, their duties and the processes during every stage of the PPP Project, including the involvement of the respective ministries in the envisaged PPP Project. It also subjects the processes to clear economic evaluation/feasibility studies, identifies the key provisions of the PPP Project Agreement noted earlier, and makes specific references to the possibility of resorting to arbitration or other alternative dispute resolution mechanisms in case of disputes with the private partner. The PPP Law also provides for increased accountability and transparency regarding the PPP Projects, in order to reduce the possibility of corruption.

However, the PPP Law, although very extensive in its provisions, has a number of limitations, in that it does not specifically:

- provide timeframes that are to be respected from the moment the PPP Project is proposed until the PPP Project Agreement is ultimately signed. The Private Party should be able to anticipate the timeframes of main milestones – if not all – that lead to the awarding of the PPP Project Agreement;
- deal with PPP Project financing, nor does it give sufficient means to seek such financing, which would be very important in the case of long-term, large-scale projects;
- institute a grievance committee or a similar body in charge of examining potential recourses by the private partner against the decisions of the relevant authorities involved in the PPP Project processes;
- delineate different models of PPP Project Agreements, based on project nature and specific risk; it also does not include clear force-majeure rules;
- provide for "step-in" rights for lenders (not requiring re-tendering), or termination compensation for assets transferred to the public entity including employer termination or stability clauses protecting against discriminatory law changes.

However, nothing in the PPP Law excludes the incorporation of provisions to effect these into individual PPP Agreements. Further, in order to alleviate some concerns from the public, a requirement clause could have been included that a minimum percentage of the jobs created from a PPP Project, one of the main benefits of projects, should be allocated to Lebanese workers, especially in view of the already very high unemployment rate in Lebanon of some 25% nationally and, in some areas, even higher. Despite the cited limitations, the PPP Law does institute a comprehensive legal framework for PPP Projects that is largely in line with international standards.

Final Remarks

With the passing of the PPP Law by the Lebanese Parliament, an effective and appropriate legal framework should be in place that should offer the customary guarantees that foreign private investors and international financial institutions often seek. It should give the assurance that

Lebanon is open for transparent tendering of PPP Projects and should, thus, attract private investments also in transport infrastructures. The Greater Beirut Urban Transport (GBUT) project, carried out for the Lebanese Council for Development and Reconstruction (CDR) by a consulting group composed of TEAM International (a Lebanese consulting firm), Institut d'aménagement et d'urbanisme de la région d'Île-de-France (IAURIF), and Société française d'études et de réalisations de transports urbains (SOFRETU), and which is being implemented in stages since the 1990s, could well benefit from this new law. Thus, it is hoped that it will attract private investments in Lebanon's various ambitious transport infrastructure development plans, which should not only help its people, but also the country itself, to move forward.

Finally, improving the road network and renovating the public transportation system will not only decrease traffic in the capital but will also allow investors to widen their projects' scope to areas outside the capital. In turn, this will revitalize numerous rural regions across Lebanon and hence set the ground for stronger national economic growth and employment and, at the same time, contribute to a cleaner environment and less CO_2 emissions in the medium-to long-term.

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Preventing Work Related Psychological Issues: A Review of Depression in Fly-in fly-out Workers & Prevention Strategies.

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Abstract

Depression has been connected with the fly-in fly-out work-style in the mining and resources industries, affecting worker's mental health, relationships, and ability to perform their work duties. Evidence suggests the geographical remoteness, long working hours and time spent away from family and friends are contributing factors to the development of depression and poor mental health among fly-in fly-out workers. Whilst there is increasing literature regarding depression and fly-in fly-out workers, it is considered empirical evidence. An evaluation of published literature regarding an overview of depression, the fly-in fly-out lifestyle, the effects of depression on fly-in fly-out workers, current prevention strategies in the workplace, and relevant legislation is discussed in this article.

Key words
Workplace depression. Fly-in fly-out (FIFO) workers. Preventing depression.

Introduction
The mining and resources industry in Australia adopted the fly-in fly-out (FIFO) working arrangement in the mid 1980's. With the mining boom and demand for minerals and resources from developing countries, the FIFO work-style has become increasingly popular as a means of work (Misan & Rudnik, 2015). The work arrangement has proven to be challenging, with workers becoming emotionally exhausted and mentally strained at times. This deterioration of mental health can lead to mental health disorders including depression.

Depression is a common mental health disorder and is also the leading cause of disability. It affects the individual's health, leaving them constantly emotionally exhausted and unmotivated to physically perform tasks and duties at work (World Health Organization [WHO], 2017). With studies showing projections of depression being the principle reason behind work disability by 2020 (Tan, Wang, Modini, Joyce, Mykletun, Christensen, & Harvey, 2014), and increased related literature regarding the issue and suicide, mental health has become a gradually concerning issue among Australian FIFO workers.

Methodology
A literature review search was conducted initially using Proquest, Medline, and Ebook Central to explore depression in FIFO workers and prevention strategies. The search selection was limited to using peer-reviewed articles, full text English journals, and E-books that had been published between the date ranges of 2007 and 2017. The key words used in the initial search were "depression and fly-in fly-out" and produced a result of 52, 11796 and 41 articles respectively. Several searches followed, and additional key words were incorporated which related to the specific desired literature required. These included "symptoms of depression", "effects of depression", and "workplace prevention of depression". Of these publications 10 journal articles and 4 E-Books were suitable to include in this article.

Government websites, including the Australian Bureau of Statistics, were used to analyze statistics and trends of depression in the workplace from publications including the 2014/15 National Health Survey. Reference to 3 websites is included in this article. A search on the Australian Human Rights Commission "depression in the workplace" also provided relevant Australian legislation including the *Disability Discrimination Act 1992 (Cth)* and *Fair Work Act 2009 (Cth).* Reference to both of these laws is included in this article.

Discussion
Depression: An Overview
Depression is a mental health disorder in which an individual experiences a persistent period of feeling sad, miserable, useless and depressed. Depression makes an individual feel as if work, relationships, and various other aspects of life have been derailed. Activities that were once enjoyed are lost interest in, and being alive suddenly becomes a burden (Miller, 2008). The Australian Bureau of Statistics (2015) reports in their National Health Survey that in 2014-15, 2.1 million people, or 9.3% of the Australian population, reported having depression or depressed feelings.

The symptoms of depression vary from person to person. Wasserman (2011) claims that the common signs of depression include appetite changes, insomnia, reduced performance, loss of energy, constantly feeling miserable and tired, experiencing inappropriate feelings of guilt and worthlessness, concentration and decision making problems, and thoughts of death and suicide. Moy (2009) states that depression can be caused from a combination of life factors, with susceptible individuals tending to have a family history of the disease. The environment in which an individual is exposed to heavily influences their mental health, with the mental disorder being prevalent in low socioeconomic households and poorer neighborhoods (Dupéré, Leventhal, & Lacourse, 2009). The loss of a loved one, trauma, accompanying physical illnesses, difficult relationships, work pressures and stressful situations are all additional factors that may trigger a depressive episode and further cause depression (Moy, 2009).

The Fly-In Fly-Out Lifestyle
Fly-In Fly-Out (FIFO) refers to a cycle in which work is performed away, usually at a remote site, for an extended period of time. FIFO is increasingly common in the mining and resources industry in Australia and the working day at these sites usually consists of a twelve hour-long day (Misan & Rudnik, 2015).

Like any type of work, there are pros and cons of the FIFO lifestyle. The pros of being in the industry and working as FIFO include the financial rewards, which further result in an improved lifestyle and enhanced quality of life, an extended leisure time, and improved personal and family well-being (Sharma, 2009). On camp accommodation is usually of a high standard, with the workers fully catered for in terms of meals, and services and amenities including gyms, pools and cinema rooms (Perring, Snow, & Buys, 2014).

Dittman, Henriquez, & Roxburgh (2016) state that the cons, and negative effects of FIFO, include the loneliness and relationship stress from the extended period of time away from home, fatigue from working long hours and shift work, missing important family and social events, physical health implications from becoming overweight or obese, deteriorating marriage, alcohol and other substances abuse which can result in increased rates of anxiety, depression and suicide.

Effects of Depression on Fly-In Fly-Out Workers
Depression can have damaging effects on an individual's health and wellbeing, as well as work, family, and associated relationships. Feeling sad and miserable, decreased motivation, and lack of energy interferes with an individual being able to work and perform tasks. If an individual is not fit for, or able to, work, their employment may be jeopardized and termination may result (Hammen & Watkins, 2007).

McPhedran & De Leo (2014) claim that workers in the mining and resources industry under a FIFO contract are more likely to experience relationship problems, work-family stress and develop depression than workers in other occupations. The negative effects of FIFO including the geographical remoteness and long working hours create intense stress on family and associated relationships, further damaging the workers mental health and often resulting in anxiety and depression. Whist depression, work-family stressors, and deteriorating mental health, all do act and create a possibility of an elevated risk of suicide; there is little research and empirical evaluation of this proposal. McPhedran (2015) found that there were no significant differences, in terms of psychiatric history, between FIFO workers that died from suicide in the mining and resources industry compared to those in other occupations. This suggested that FIFO workers who took their lives had no higher prevalence rate of mental health implications relative to those who had taken their lives working in other occupations.

The Prevention of Depression
Depression is among the leading cause of sickness absence and work incapability in developed countries, with it projected to be the principal reason of work disability by 2020 (Tan et al., 2014). In the early stages, depression is the most manageable mental health disorder, and so prevention strategies are essential in the workplace for those at risk and for employees showing signs and symptoms, to directly target the mental health disorder (Dietrich, Deckert, Ceynowa, Hegerl, & Stengler, 2012).

Tan et al (2014) claims that workplace based interventions can simultaneously reduce the symptoms of depression as well as enhance worker's coping skills and resilience to depression. Their study showed there were three types of prevention strategies, aimed at different audiences in the workplace. These prevention strategies included universal prevention, directed at an entire

population; selective prevention, directed only to those at high risk and indicated prevention, directed only to those with emerging symptoms in the workplace.

Among FIFO workers, the universal prevention strategy is the most effective of the strategies as it reaches the entire working population of the site, including the selective and indicated groups. Targeting the entire population is important as it reaches individuals who, out of fear of stigmatization and negative effects on their employment, might not want to disclose symptoms or seek treatment (Tan et al., 2014). Onsite chaplaincy is an effective prevention strategy in reducing symptoms associated with depression and improving a FIFO worker's overall health and wellbeing. Ebert & Strehlow (2017) report that chaplaincy services on mine sites are becoming increasingly common in the mining and resources industry. Chaplaincy services are appealing due to the confidentiality and 24/7 availability, where the chaplains aid in relieving mental work-related stress, anxiety and depression symptoms and prevent suicide.

The Legislation

Legislation relevant to depression in the workplace consists of the *Disability Discrimination Act 1992 (Cth)* and the *Fair Work Act 2009 (Cth)*. Depression is a common mental health disorder and is covered by the definition of disability according to the *Disability Discrimination Act 1992*. Under the *Disability Discrimination Act 1992* it is unlawful to discriminate in the workplace against someone who has a disability (Australian Human Rights Commission, n.d). Under the *Fair Work Act 2009*, when applying for a job or during any time of employment, an employees age, sex, race or disability must not be taken opposing action against by the employer (Australian Commonwealth Government, 2009).

Conclusions

In conclusion, workplace mental health and mental health disorders, such as depression, must be addressed effectively. Whilst most studies are empirical evidence, prevention strategies must be an action requirement on each site to ensure the prevention of depression in the workplace and an overall improvement in the mental health of FIFO workers.

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Climate Change Action - The Time is Now!

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Abstract

This paper highlights the urgent need for climate change action based on the devastating impacts and effects of climate change that are evident in local communities. It examined the background of climate change in Nigeria, its impacts in various areas in the country, possible mitigation and adaptive measures and the challenges faced in implementation of risk management. The article highlights that there is a need to assess and adapt climate change measures specifically to the community or areas. A review of some green initiatives was conducted to assess adaptability in the Nigerian environment with examples of where management has been successfully implemented included. The conclusion was that there was a need for all stakeholders to take climate actions collectively for effective implementation.

Key words
Climate Change, Adaptation, Mitigation, Green Initiatives, Environmental, Sustainability, Climate Action, Nigeria, Stakeholders, Africa, Risk Management, Communities, Health, Global Warming, Green House Gases, Intergovernmental Panel on Climate Change (IPCC), Socio-Economic, Impact

Introduction
The visible change in the climatic weather conditions is no longer a myth and the African terrain is already experiencing the devastating impacts. Our planet is rapidly changing due to an increase in the burning of fossil fuels and the release of several greenhouse gases (GHGs) into the atmosphere through landfills, transportation, power plants, hydrocarbon & mineral exploitation and mechanized agriculture resulting in varied global warming potentials. From 1880 the temperature of the earth has risen 0.65 to 1.06^0 Centigrade on average (Patel, et al., 2019). In Nigeria, industrial activities leading to associated gas flaring has a substantial effect on climate change and has contributed more greenhouse gas emissions potential than all other sources in sub-Saharan Africa combined.

Some of the specific apparent climatic impacts include:
- An overlap of the climatic seasons making it difficult for farmers to predict and plan the production season,
- Increasing rise in temperature resulting in drought and water scarcity
- A rise in sea levels along the Nigerian coastal States leading to increased rainfall, flooding and coastal erosion;
- Increasing vector borne diseases like malaria and dengue virus due to increased humidity and heat. A recent World Health Organisation (WHO) report states that between 2030 and 2050 climate change is expected to cause 250,000 additional deaths per year due to malaria, malnutrition, diarrhoea and heat stress.

The recent Intergovernmental Panel on Climate Change special report on global warming of $1.5^0 C$ (IPCC, 2018) showed that a rise in temperature from 1.5 degrees to 2 degrees would result in far more devastating effects therefore emphasising the need for immediate climate action. Addressing this global issue would involve a collaborative climate action by all stakeholders to include inter-governmental participation to inform, influence and empower the leadership to solve the climate crisis; demanding actions from our policy makers, promoting sustainable solutions through advocacy and education in addition to individual behavioural change and creating awareness through engagement at the grassroots level. The implementation of effective climate change mitigation initiatives and adaptive measures will go a long way to mitigate the effects of climate change.

This article first addresses the climate change impacts; mitigation and adaptive measures then focuses on the climate actions to be taken to ensure this climate change issue is adequately assessed in Nigeria.

Objectives
The objectives of this article were to:
- Create awareness on Climate change impacts in Nigeria.
- Provide update on the mitigation measures.
- Promote improvement options on the existing adaptation practices.
- Highlight the urgent need for climate action

Climate Change
The following are some facts highlighted about Climate Change as emphasized during the Climate Leaders Training in Los Angeles, USA.

(Gore, 2018)
1. The year 2017 was the 41st consecutive year with a global temperature above the 20th century average.
2. Climatic shifts create shortages of resources such as land and water
3. There is a 1st Sea level rise, rainfall, storms and increased flood frequency
4. A 1.5-degree temperature increase results in more devastating impacts to humans and the environment
5. Climate change is a medical emergency
6. CO_2 is released into the atmosphere faster than at any time in last 66 million years.
7. With each additional 1°(C) temperature, the atmosphere's capacity to hold water vapor increases by 7%
8. Globally, floods and extreme rainfall events now occur four times more often than in the year 1980
9. Water scarcity already affects more than 40% of the world's population
10 Enough solar energy reaches earth every hour to fill the entire world's energy needs for a full year.

Factors Affecting Climate Change
The following are factors that affect climatic changes in Nigeria (Nze *et.al*, 2010). Demographics: Increasing population of 180 million with a dense population in the East / West of 923,800 km. sq. Total area. Technology /Energy: The increased energy consumption, increased fossil fuels use, increased greenhouse gas emissions. Social Economic: fluctuating climatic conditions, land-use pattern changes, food security. (Gore, 2018)

Impact of Climate Change
Climate change impacts can affect various sectors and industries (Ezegwu, 2014; Serdeczny et.al 2015) such as landfill: resulting in air pollution, land pollution, ozone depletion and flooding. Agriculture: resulting in low yields; crop failure, change in rainfall pattern, loss of livelihood. Industrialization resulting in gas flaring, droughts, sea level rise, disease epidemic.

There are other existing impacts that are already visible in Africa (Akpodiogaga, & Ovuyovwiroye, 2010; Awojobi & Tetteh, 2017) such as fluctuating weather conditions between the two seasons resulting in undefined rainy season with increased rainfall and harmattan characterized by dry wind, humidity and increased heat undefined. Extreme hydrological features- South West (Lagos, Ondo); Northern states (Kaduna, Adamawa, Taraba). Shrinkage & disappearance coastal areas (Lake Chad, Alfa beach). Reduced freshwater supply leading to impacted areas and reduced land use. Water scarcity and water stress leading to low accessibility and availability.

Coastal erosion in the Nile River Delta leading to an increased threat to coastal areas. Rising sea levels resulting to increased rains and changes in land use. Droughts in the following some areas such as Niger River Basin, Borno, Kano, Adamawa. Agricultural impacts leading to loss of crop variety, saltwater intrusion. Collapse of Nukkai & Sokoto bridges in 2010. Impact Livelihood such as fishing, farming and herding. Human settlement impacts leading to Migration and the displacement of people.

Challenges
There are some challenges that hinder full implementation of mitigation measures or prevent climate change issues from being addressed. They include inadequate finance. Inadequate resources and resource utilization. Gaps in policy implementation. Inadequate capacity building. Technological shortfalls. Insufficient awareness and education

Mitigation Measures
The following mitigation measures are recommended by the author be adopted as initiatives to minimize the impacts of climate change. Energy efficiency, renewable energy deployment, carbon sequestration, Smart agriculture / Triple win and Clean Development Mechanism.

The following are examples of green initiatives that can be adopted to ensure that Climate change is mitigated in any community.

Landfill resource utilization:
This can be adapted by applying the following:
1. Efficient Waste Management
2. Material Recovery Facility including Recycling
3. Landfill Gas Pipeline Network.
4. Mechanism to Collect & Store Landfill Gas.
5. Gas Capture.
6. Electricity and Power Generation.
7. Electricity Distribution Network.

Agriculture. The Triple Win Concept can be adapted as mitigative measures for farmers to improve agricultural practises, increase productivity, improve crop resilience to droughts and to generate stronger soils to promote carbon sequestration (Idowu, Ayoola, et.al. 2011).

Climate Smart Agriculture: Includes banana stem planting, source of plant nutrient, minimise resources and water retention capability

Clean development mechanism (CDM). This is a mechanism that monitors the emissions generated from executing projects. The following are features of this program. Some technologies are applied to projects in compliance with the Kyoto Protocol (UNFCC, 2002). Emission-reduction projects in developing countries can

earn certified emission reduction credits. A total registration of 7,800 projects have been conducted across 107 developing countries and has resulted in the generation of over 1.5 billion tons of GHG generated over the period. This initiative is being implemented on various projects. In Nigeria specially, eleven (11) CDM projects have been registered to earn carbon credits since 2006.

Climate Change Adaption
The way forward for taking Climate action in Nigeria would involve the following steps:
- Adopt environmental friendly lifestyles.
- Provide resource management/education for impacted areas
- Promote the use of drought resistant crops and mixed farming
- Expanding and optimizing existing irrigation infrastructures on the farms
- Provision of accurate and timely weather forecasting by the federal agency –National Emergency Management Agency (NEMA).
- Enforce international policy on climate change in Nigeria
- Facilitate carbon trading initiatives/ projects in Nigeria.
- Implementation of Green Initiatives such as: fuel efficient stoves; use renewable energy sources such as hydro and solar; have gas flare reduction initiatives; use efficient gasoline cars or trucks; improve electrical appliances; conduct reforestation or afforestation.

Take Climate Change Action
There is a need for immediate action on climate change. The responsibility lies on all stakeholders to achieve this as follows based on the following responsibilities. Government is responsible for developing regulations. Economist are to provide advice on carbon pricing. Businesses is to provide subsidies for these initiatives. Humans will adopt sustainability measures.

The following are steps that can be taken immediately to implement climate actions:
1. Invest in Capacity Building & Technological Transfer.
2. Build Climate Resilience now to reduce Future Vulnerability.
3. Enforce and monitor policies such as Gas Flare Reduction and Extended Producer Responsibility- ERP.
4. Implement the Paris Agreement of 20% emissions reduction.
5. Invest in and promote more CDM projects to earn carbon credits to reduce emissions

Conclusions
There is a need to take climate action now and the following are being proposed as ways in which we can make sustainability a way of life, so

we can work together to save the earth which is our Home. Implement action steps to make a difference, to combat the impacts of climate change and make a difference in our local community. Continue to inform, influence and solicit for solutions to climate change. Empower our leaders by providing facts about climate change issues so they can make decisions to solve the climate crisis. Each individual should adopt sustainable lifestyles and include in their daily activities. For us to achieve all these, we need be make a conscious effort to lend our voice in creating awareness within our local communities by taking climate action.

In conclusion, there is an urgent need for climate action to take place at all levels pronto and the Climate Reality Project, World Safety Organisation amongst other advocacy and non-governmental groups are in the fore front of stirring up climate conversations to influence and empower the global community to act to mitigate the impacts of climate change to change climate change effects. This will involve an integrated approach by all stakeholders. There is an imperative need for a paradigm shift, so we can achieve this and have a sustainable planet for the future generation to inherit from us. Let us all continue to work together to preserve the earth by making sustainability a way of life.

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Safety Climate and Risk Attitude.

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Abstract

Research Aim

To identify factors that affect safety climate and attitude towards safety risks in organizations.

Results

The origins of safety climate predate (1951) references in published literature to safety culture (1986). Safety climate originally referred to the psychological climate in workplaces and how this affected accident causes. While safety culture is an organizational outcome, safety climate was identified in published literature as the individual's perceptions, actions and attitude towards risks. The actions of management were found to influence safety climate, culture and work related risk perception.

Conclusions

This review of published literature has revealed that safety climate, culture and risk attitude are significant aspects of safety performance in all organizations and are influenced by the leadership of senior management and other managers. There is, consensus amongst researchers and authors that the culture and climate of an organization are key determinants of organizational and safety performance.

Key words

Safety climate. Safety culture. Risk attitude. Workplace management.

Introduction

The safety culture and safety climate of an organization are crucial parameters of its performance with respect to safety-related matters. This has been widely researched, documented and agreed upon by many authors. However, there is a general lack of clarity about and consensus on the exact descriptions and definitions of the concepts of safety culture and safety climate (Guldenmund, 2000; Filho & Waterson, 2018). The significance of this research lies firstly in identifying a possible link between the awareness of risk and attitude of organizational decision-makers (in particular senior management) towards it, and how safety culture and safety climate may develop as a result of such awareness and attitude. It was considered important to identify opportunities for improving the understanding of risk, not only in senior management but throughout the entire organization. Improving the understanding of risk should improve the attitude of people towards it and help them to make better informed decisions. This should result in improvements in the effectiveness of the safety culture and safety climate, which should ultimately result in improved organizational safety performance.

This review of published literature found that there was a lack of research on safety culture and safety climate in not-for-profit organizations, apart from the health care industry. Organizations like charities, volunteer bodies and religious groups are all exposed to risk of some description and the suspicion is that, in many cases, there is a lack of awareness amongst most members and at least some leaders of such organizations. Generally, these bodies cannot afford the luxury of employing people with occupational health and safety qualifications to manage safety matters, leaving them exposed to liabilities they may not even be aware of.

Research aim

The aim of this research was to identify factors that affect safety climate and attitude towards safety risks in organizations.

Methodology

To achieve the research aim a review of the published literature was considered to be the most appropriate study design, as it would afford an in-depth overview of the body of knowledge regarding safety climate end risk attitude. To establish a baseline for this literature review, Google Scholar was searched with the phrase "safety climate", producing 4,890,000 results. Articles were selected for review, based on relevancy deduced from titles of articles. For the rest of the research, it was decided to consider only literature reviews and scholarly journals, assuming that this would ensure the following. Optimum retrieval of relevant publications. Sufficient commonality of topics. Reduction of the number of publications retrieved to reasonable numbers, closing the gap between the numbers of articles retrieved and the number finally selected, making the final selections more representative. It was decided not to limit any of the database searches to a specified date range, to ensure that all available articles would be retrieved. In all cases, the final requirement for citation in this article was the degree of relevancy to the research topic, which was concluded by reading article abstracts. Other inclusion criteria are described below.

The ProQuest database was searched for the phrase "safety climate AND safety culture AND risk attitude" and it produced 319,723 results, amongst which 217,840 were dissertations and theses, 66,238 were scholarly journals and 17,875 were reports. Publication search criteria full text and peer-reviewed were then selected, reducing the number of search results to 52,925, amongst which were 51,698 scholarly journals and 14 reports. Additional search criteria of English language, literature reviews and scholarly journals were then selected, producing 167 search results. The Science Direct database was also searched using the phrase "risk attitude AND safety climate" and it produced 45,319 results, amongst which 28,087 were research articles and 3,015 were review articles. It was decided to consider only review articles and the publication type was limited to only research in safety behavior. Other sources searched for relevant and cross-referenced articles included Curtin Library books, Taylor and Francis Online, JSTOR and Google Scholar. The criteria applied in these instances were also peer-reviewed, review articles and English language, without application of any date range. A total of 53 articles are referenced in this literature review.

Results and Discussion.
Safety climate
Guldenmund (2010) quoted the earliest reference to safety climate as that offered by Keenan, Kerr, and Sherman (1951) in their study of psychological climate and accidents in a tractor factory. They found that prospects of promotion and a comfortable work environment seemed to encourage safe behavior, whereas crew work in difficult operations, increased manual work, incentivized work (as opposed to work at normal payment rates) and the omnipresence of an obvious risk, seemed to correlate positively with increased accident rates.

In a study conducted to describe safety climate and its implications for industrial organizations, Zohar (1980) found that the concept of safety climate presents both theoretical and implied implications. The most significant implication is that the commitment of senior management to safety is a major contributing factor to the success of industrial safety programs. It can be expressed via implementation of training courses, delegation of decision-making authority to safety officers, senior management engagement in safety committees and consideration of safety in ergonomic design. What actually occurs in most instances, though, is that managers regard safety as a standalone, technical aspect of the production process, separated from the rest of the management function. However, in ensuring compliance with regulations and demonstrating

that their responsibility in terms of safety is not being ignored, management allocates all responsibility to designated safety officers, without the associated and required executive authority. Another important implication is that workers have a shared perception, principally guided by their perceptions of management attitude towards it, of safety in their organization. This suggests that prerequisites, to any effort of safety improvement in an organization, are an authentic change in the attitude of management and increased engagement.

According to Schein (1992), quoted by Guldenmund (2000), climate is envisioned to pave the way for culture and it will echo and express cultural assumptions. Ultimately, culture will substitute climate and communicate a more comprehensive and insightful meaning. Guldenmund (2000) suggests that the term "organizational climate" might have implied the general concept envisaged by researchers at the outset but it has progressively been constrained to indicate attitudinal or psychological aspects in an organization.

In a review of the theory and nature of research around the concept of safety culture, Guldenmund (2000) concludes that a globally satisfying model of either safety culture or safety climate does not exist. However, he distinguishes between culture and climate and relates it to the layered model, quoting Schein (1992). Climate is compared to espoused values, which are subsequently branded as attitudes. As a consequence, the safety climate of an organization comprises of the attitudes of its employees towards safety. Attitudes are usually directed at objects, which could take any discriminable form: it could be abstract, for instance safety or policies; or concrete, like fire extinguishers or personal protective equipment (PPE); or behaviors, e.g. taking risks or breaching rules. These attitudes and objects could constitute the substance of safety climate, and the cause could be the safety culture. Ultimately, the outcomes of safety climate would be the responses evaluated, whether that be of a cognitive, affective or behavioral nature.

Manser, Brösterhaus, and Hammer (2016) reviewed 11 instruments of safety climate measurement, which have been evaluated for their psychometric properties in a German-speaking country, to provide advice on their use in improving quality and patient safety. It was found that, while the names of the 11 instruments generally reflected the terminology used in the earliest instruments, the choices of words reflected the arguments in the literature around the theoretical differences between safety climate and safety culture. Quoting Waterson (2014), they suggest that there has apparently

been agreement of late, that safety climate signifies the mutual perceptions about aspects relating to safety amongst employees. Safety culture, on the other hand, is indicative of the fundamental principles, beliefs and behaviors, which affect the management of issues relating to safety in organizations. Chiri (2014) studied the influence of safety culture and the function of leading indicators in enhancing safety performance in the workplace. His findings were that safety culture and safety climate, despite being distinct concepts, act in a complimentary fashion to each other, to produce a culture auspicious to safety. The following tabulation outlines the differences between safety culture and safety climate:

Table 1: Differences between safety culture and safety climate (Chiri, 2014, p.29).

| Safety Culture	Safety Climate
• Is an organisation level issue	• Is an individual level issue
• Refers to shared meaning about safety and collective commitment to safety	• Refers to psychological characteristics of employees (e.g. how a person feels, corresponding to the value, attitude and perception of each individual with regard to safety with an organisation)
• Concerned with the creation of a viable safety management system for effectively controlling hazards	• Concerned with employees' perceptions of management safety values and commitment to safety
• Widely shared awareness of hazards/risk	• Individuals awareness and perception of risk
• In the aftermath of a major accident, working practices and rules, competences and compliance, reporting and learning cultures will be systematically examined and under go long term modification.	• In the aftermath of a major accident, it is the individual values, attitudes, perceptions and patterns of behaviour that will undergo immediate scrutiny and modification.
• Widely shared behavioural norms and deep seeded values that does not change quickly	• Changes more quickly as it is superficial and more transient than safety culture
• Visible leadership commitment to safety	• Relies on individual commitment to safety
• Over-riding commitment to safety (i.e. assigning the highest priority to safety)	• Individuals attitude to violations
• Supportive environment	• How an individual feels to be a member of an organisation
• Is a leading indicator of organisational culture	• Is a leading indicator of safety culture

In a study utilizing a field experimental design to test the influence of a polygonal intervention in improving safety climate, Bronkhorst, Tummers, and Steijn (2018), quoting (Zohar, 1980), suggested that safety climate refers to the way employees perceive organizational policies, procedures and practices, with regards to safety. The concept of safety climate fulfils an informative role with respect the significance of safety, relative to other, rivalling priorities, like production or cost control. In other words, it highlights the importance of employee health and safety, in comparison to other important functions in the organization. They considered three common leverage points to improve safety climate perceptions:

• The commitment of senior management towards safety, which is a critical dimension of

safety climate in any organization (Flin, Mearns, O'Connor, & Bryden, 2000).
• The commitment of supervisors, to being examples of safe behavior in the workplace, is a pivotal element (Zohar & Luria, 2005).
• Group norms and behavior, as these are shaped not only by senior management and supervisors but also by how employees are influenced by their fellow-employees (Jimmieson et al., 2016).

Zohar (2008) proposed an extension of the existing framework of safety climate into a multi-level framework, recognizing distinct constructs at organization-level and group-level. A further extension, identifying a work-ownership climate as determining, and complimentary to, the effect of safety climate on behavior of employees, is also proposed. The work-ownership climate revolves around how far supervisors and managers allow work-related issues to develop and convert to recognized ownership objectives. A climate with a high level of work-ownership is one where employees identify and are encouraged to own specific aspects of their work, whereas a climate with a low level of work-ownership is one where there is lack of support for developing such ownership of work. Given the two-dimensional (compliance and citizenship) nature of safety behavior, there is a likelihood that the two climates described above will interact and result in an array of outcomes, depending on their distinct levels. *Safety minimization* will result when employees have little control over their work. They are unlikely to ignore safety rules in achieving their goals, however, they are likely to take short-cuts if no immediate danger is identified. *Safety defiance* will occur when ownership targets focus on the process or outcomes and exclude safety considerations. *Safety compliance* is achieved when employees have no control over work and are only expected to follow rules and procedures to get the work done. *Safety citizenship* develops under the expectation that employees will consider operational safety as an ownership target and appropriate action is directed at achieving this target.
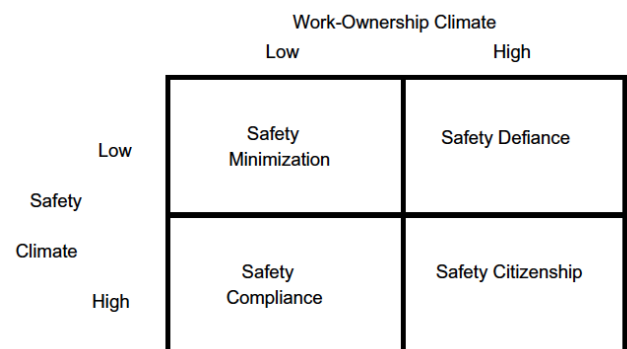
Figure 1: Multi-climate framework for occupational safety (Zohar, 2008, p. 383).

Bosak, Coetsee, and Cullinane (2013) studied the interactive relationship between management commitment, safety priority and production pressure as dimensions of safety climate and their effect on how employees report risk behavior. They demonstrated that these three dimensions impacted risk behavior differentially, however directly and that there was a complex inter-relationship between these in affecting unsafe behavior at work. Risk behavior of employees was found to be negatively related to management commitment and safety priority, whilst it was positively related to production pressure. An increase in employee perceptions of safety being considered by the organization as an important matter, being given priority and of senior management acting and communicating in support of it, will lead to a reduction in unsafe behavior. On the other hand, when employees perceive competition between achieving production targets and complying with safety procedures, they are likely to forfeit safety and engage in behavior, which puts them at risk (Bosak, Coetsee, and Cullinane, 2013).

As in the case of organizational climate, the articles reviewed demonstrated safety climate to be a manifestation of how the employees of an organization actually experience safety in their workplace, in relation to how it is purported to be. Again, the level of engagement by management emerged as a crucial determining factor.

Attitude towards risk
There are many different definitions of risk, rather than a single, universally accepted definition. The closest approximation to the latter is the definition given by the International Organization for Standardization (ISO) who define risk as the effect of uncertainty on objectives and outcomes. An effect comprises a positive or negative divergence from what is expected, and it can give rise to opportunities and threats. Objectives can apply at distinct stages and have different facets and classifications. Risk is normally stated with reference to its source/origin, possible occurrences, consequences and likelihood (ISO, 2018).

Hopkins (2005) argues that effective risk awareness is that, which functions at the operational, as well as individual level. Risk awareness is, more often than not, dependent upon the attitude of an individual, just as safety culture is sometimes viewed as characteristic of an individual. It is heavily dependent upon the organizational milieu and as individuals develop greater risk-awareness, their propensity to report issues and recommend safety enhancements, increases. Management failure to act upon these recommendations will abruptly lead to discouragement of individuals to continue their

engagement. This failure on the part of *management* can be the result of *risk blindness* or *risk denial*. The former means being unaware of risk, while the latter suggests there is some measure of risk awareness, but it is linked to active dismissal of the implications posed by the risk or risks.

Awareness of, or understanding of, risk can influence the way in which individuals and groups comply with safety regulations, according to Pilbeam, Doherty, Davidson, and Denyer (2016) who conducted a systematic literature review to investigate the claim by some authors, that safety leadership has a positive impact on safety compliance in the workforce. They deduced that safety compliance is burdened with quandaries and clashes, because the understandings of what specific risks comprise and how they can be moderated, differs between groups of people. Smith (2012) refers to management line of sight as a notion of how well management understands the risks, which their organization is exposed to and their degree of certainty that measures have been adequately implemented to control these risks. This concept revolves firstly, around understanding why there may be a discontinuity between the anticipated and actual functioning of the organizational safety management system and secondly, around restoring continuity. To demonstrate, Smith (2012) mentions the fire and explosion, which occurred at the BP Texas City oil refinery on 25th March 2005 and resulted in 15 fatalities and 180 injuries. A major causative factor identified during the investigation of the accident was the bearing, which corporate reductions in the budget had brought on operational safety at the refinery. The United States Chemical Safety and Hazard Investigation Board (CSB) is quoted in their report as stating the following: "Cost-cutting, failure to invest and production pressures from BP Group executive managers impaired process safety performance at Texas City" (CSB, 2007, p. 25).

According to Waring (2015), the overall behavior and actions of an individual are determined by his/her knowledge, awareness and understanding of risk topics and the preferences selected, conclusions drawn and actions taken in response to it. An attitude towards risk, both generally and specifically, is acquired through and affected by learning and experience. It is key to understanding of risk, it foretells behavior, reasoning and actions and is equally applicable to the boardroom and all other areas in an organization. He quotes Smallman and John (2001), who studied the perspectives held by company directors in Britain, of the influence of health and safety on corporate performance. They found that the directors focused on disaster

liability, duty and pride in high levels of efficiency and sound practice. Corporate reputational damage as a result of inferior health and safety performance did feature as a liability concern. However, an outstanding health and safety record was not regarded as an amplifier of reputation beyond that, which suggests that there is a cost-benefit limit, beyond which returns from *excessive* labors in safety were viewed as being of a diminishing nature. It also suggested a justification of compromises between the cost of safety programs and the potential cost of safety failures.

Wilde (1982) extended the theory of risk homeostasis, applied in the area of road traffic accidents, to the realm of human behavior associated with health matters and contemplated the development of a general hypothesis of human behavior, when confronted with uncertain consequences, in other words, risk. He proposed that a person, while driving a vehicle, performing an industrial task, participating in a sport or being involved in any other sphere of human behavior, which can potentially impact on health and safety, is engaged in a homeostatically controlled process of self-regulation. The level of risk experienced suddenly, at any point in time, is equated to the level of risk the person is prepared to accept and behavior will be modified when these two levels are different. The potential for the modified behavior to re-balance the target and experienced levels of risk will be determined by the person's proficiencies of perception, decision and execution.

Swuste, Groeneweg, van Gulijk, Zwaard, and Lemkowitz (2017) studied models and theories of general management and safety, which had an impact on safety management during the time between the Three Mile Island incident of 1979 and the Piper Alpha incident of 1988. Amongst others, they quoted Hale and Glendon (1987), who argued that operators and maintenance personnel generally possessed outstanding mental abilities to process information and system deviations were only sporadically caused by errors. Operators had good corrective skills and could easily and quickly return a process to the intended mode of operation. It did occur, though, that systems deviated out of control, but this was normally not as a result of human error. Rather, it was caused by lacking system knowledge, excessive information, inadequate consideration of potential risks in management decisions and disaster situations. A case in point is the Deepwater Horizon disaster, in which 11 workers died when the drill rig exploded on 20 April 2010. Amongst others, it was concluded by the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, that the loss of the Macondo well had been preventable;

that doubt had been cast on the safety culture of the entire industry as a result of systematic failures in risk management and that exploration for and production of deep water energy entail risks, which both the industry and the government had been inadequately prepared for at the time but in future, needed to be prepared for (Deepwater Commission, 2011).

Another example of inadequate consideration of risks by management is the methane gas explosion at the Pike River underground coal mine in New Zealand on 19th November 2010, in which 29 people were killed. It was a new mining operation and the sole source of revenue for the owner, Pike River Coal Ltd; incomplete infrastructure could not cater for safe coal production as yet and health and safety systems were deficient. Amongst others, the Royal Commission on the Pike River Coal Mine Tragedy found that there had been 21 reports of the presence of explosive levels of methane gas in the mine workings, during a period of 48 days prior to the explosion – the last report on the morning of the tragedy. There had also been 27 reports of lower levels of methane gas, yet with the potential to be dangerous, during the same period of time. These warnings were all ignored, and the mine was set up for tragedy, because there was pressure to produce coal before the mine was ready for it, to alleviate the need for the owner to sustain operations on borrowed money. The view of the Royal Commission was that, despite operating in a highly hazardous industry, the board of directors failed to ensure appropriate management of health and safety; executive managers failed to assess the health and safety risks, which workers had to confront and in applying pressure to produce coal, the directors and executive managers exposed worker health and safety to unacceptable risks. Mining should have been suspended until appropriate risk management could be concluded (Royal Commission on the Pike River Coal Mine Tragedy, 2012).

In a paper discussing the theory and practice required for achieving a safe organizational culture, Reason (1998) suggested three possible avenues, along which an inadequate safety culture can erode the protection of a system. All three of these are the direct or indirect result of failure to comprehend and be cautious of the entire spectrum of hazards, which the organization is exposed to. Firstly, *active failures* will most probably give rise to an increase in defensive failings. This is more likely in organizations, where there is a lack of concern about a working environment known to foster errors and omissions by individuals and groups. Such unspoken attitude suggests that business objectives supersede safety objectives. Secondly,

incapacity to understand the full spectrum of operational hazards, manifested in inadequate maintenance, tools and emergency management training, can create more gaps in defensive ability. Thirdly and most importantly, the *impact of a poor safety culture* will be visible in a reluctance to address defensive gaps pre-emptively. In other words, these gaps will be evaded and allowed to remain. Many examples of organizational accidents bear testimony to management disregarding or delaying eradication of defensive gaps already identified.

According to Sitkin and Pablo (1992), historical research has identified nine major determinants of risk behavior, grouped together in three categories:
• individual traits include risk preferences, perceptions and propensity;
• organizational traits comprise group constitution, cultural risk norms, leader risk tendency and control systems; and
• problem related traits consist of problem understanding and framing.
These determinants will influence the individual behavior of decision-makers towards risk in various ways. Those who revel in challenges, will be more inclined to engage in risky actions, than those who do not have a preference for being challenged. Similarly, the way in which it is perceived, may lead decision-makers to over- or under-estimate risk and to have superfluous confidence in their adjudications of it. Coupled with these two characteristics, are the inclinations decision-makers may have to accept or avoid taking risks.

On a broader, organizational scale, the leading predictor of risk behavior is the constitution of the decision-making group. Quoting Janis (1972) and Stoner (1968), it is proposed that the context of being part of a group persuades decision-makers to assume more radical stances towards risk. Douglas and Wildavsky (1982) are also quoted as proposing that the cultural risk values of an organization may be defined by preferences for certainty, rather than uncertainty and avoidance of risk, rather than seeking of it. In similar fashion, management models the behavior towards risk and injects their personal authenticity to accepting or avoiding of risk. This is influenced by the response of reward or punishment for risky decisions, through organizational control systems, which will methodically encourage or discourage risky behavior by members of the organization. Finally, with regards to the response to problem situations, the experience or familiarity of a decision-maker with a specific situation will determine the responsive behavior. This is likely to give rise to acceptance of risk, which less experienced decision-makers would rather avoid,

depending on how the problem situation is framed. In other words, is the problem presented as an opportunity or a threat, as a gain or a loss? Kahneman and Tversky (1984) are quoted as noting in their formulation of prospect theory, in which problem situations presented in a positive frame, give rise to risk-averse behavior, while those presented negatively, urged on risk-seeking behavior. Pidgeon (1998) identified a dilemma for organizations, which are confronted with the management of complicated and inappropriately organized job settings. It lies in a safety culture promoting a risk management approach, focused on expecting all potential hazards. Such an approach to risk may actually prevent a robust response, on the occasion of an unexpected event occurring.

The articles reviewed clearly demonstrate that there is a connection between the attitude that people, especially senior managers, have towards risk, and their level of awareness. Attitude is a function of, amongst others, learning and experience, and it is influenced by the level and duration of relevant operational exposure, the level of system knowledge and depth of understanding of operational hazards.

Culture and climate
The concepts of culture and climate, both from an organizational and safety perspective, have been researched, theorized about, written about and argued about for nearly 70 years. It would appear, however, that authors and experts in the field are no closer to reaching consensus about the definitions and meanings of these concepts in 2019, than they were in the 1950's. The absurdity of this situation is demonstrated by the fact that Kroeber and Kluckhohn (1952) found 164 different definitions of the concept of culture when they reviewed the existing literature at that time.

Despite the differences of opinion with respect to the definitions of culture and climate, there does appear to be some degree of commonality with regards to what the constituent elements of these concepts might be. A number of authors agree that organizational culture broadly comprises characteristics like the values, customs, beliefs, norms, traditions and behaviours, which a group of people shares (Barger, 2007; Guiso et al., 2006; Mathur & Kumar, 2016). Similarly, safety culture is viewed as consisting of the habits, attitudes, principles, norms, values, traditions and beliefs relating to safety (Guldenmund, 2010; Mearns & Flin, 1999; Waring, 2015). A review conducted by Guldenmund (2000) found that researchers have assigned the following common characteristics to the concept of culture:
• It is an abstract, theoretical concept, rather than a material, definite one.

- It has a reasonably steady, reasonably long-lasting nature.
- It has many dimensions, each of which are usually composed of many variables.
- It is communal to groups of people.
- It comprises various facets, giving rise to the possibility of different cultures or climates being distinguishable within a single organization.
- It creates certain habits, which can be learned and changed through influences.
- It is operational, through providing orientation towards what is considered as acceptable behavior.

As in the case of culture, the concept of climate, from an organizational as well as safety perspective, has endured much debate and many varied opinions in terms of how it should be defined. However, there appears to be some agreement that culture and climate, although associated, are not the same concepts (Guldenmund, 2000; Schwartz & Davis, 1981) and that climate describes the experiences, which employees of an organization have of their working environment, both physically and psychologically (Chatman & O'Reilly, 2016; Schneider et al., 2013; Schwartz & Davis, 1981).

Given an apparent lack of research around this particular notion, it could not be established whether organizational culture, organizational climate, safety culture and safety climate manifested differently between corporate and not-for-profit organizations. This was definitely a significant limitation to this research, however, it does prompt the opportunity for future empirical research, to shed more light on the potential difference between organizations driven by the quest for shareholder profits, as opposed to organizations providing government or sponsor-funded services to the public. Support for this notion lies in the fact that some literature on safety culture in the health care industry did demonstrate that the focus of health and safety management is on ensuring and improving patient safety, rather than on the safety of health care staff (Cox & Flin, 1998; Edmondson, 1996; Flin & Yule, 2004; Speroff et al., 2010; Stock & McFadden, 2017).

There seems to be general consensus amongst authors (Clarke, 1999; Edwards, Davey, & Armstrong, 2013; Flin et al., 2000; Hall, 1993; Kroeber & Kluckhohn, 1952; Martinez et al., 2015; Weigelt & Camerer, 1988; Zohar & Luria, 2005) about the importance of the role, which supervisors and management fulfil in setting the tone for culture and climate, irrespective of whether that is in an organizational or safety context. This is not surprising at all, as people generally take the cue from their leaders, when it comes to modelling their behavior in the workplace and in fact, most other settings.

A key finding of this research is that there does appear to be a link between the attitude of organizational decision-makers, particularly senior management, towards risk and the culture and climate of an organization, including its management of safety matters (Douglas & Wildavsky, 1982; Hopkins, 2006; Reason, 1998). This link is the result of the awareness and understanding (Pilbeam et al., 2016; Smith, 2012), both obtained through learning and experience (Waring, 2015), which people have of the risks, which their organization faces. There have been numerous industrial disasters, a few examples of which were referred to in this article, all of which resulted in tragic loss of lives and significant financial, psychological, social, environmental and reputational costs. This should be ample demonstration of the far-reaching effect, which not fully understanding the risks facing their operations, can have on the decisions that executives make and on the safety culture and climate of the organizations, which they represent. The following tabulation is offered, to illustrate the anticipation of the author on the attitude towards risk and the resultant safety culture and climate.

Table 2: Attitude towards risk and the resultant safety culture and climate.

Risk Attitude	Understanding of risk	Anticipated safety culture	Anticipated safety climate
Unaware	Poor understanding, due to lack of knowledge regarding the process of risk assessment, hazards are unidentified.	Tasks are done without assessment of risks, under the assumption that everything is in order, leading and lagging indicators of safety are unnoticed.	Unsafe working environment, unsafe work practices, high incidence of low severity, high frequency incidents, with high potential for high severity incidents. People feel unsafe but think it is "normal".
Blind	Some knowledge and understanding of the process of risk assessment, some hazards are identified. Risk management delegated to Safety Personnel.	Some hazard identification is done by workers using tools like Take 5's but merely as a paper exercise. Trends not identified. Safe work procedures exist but achievement of production targets is more important.	People feel unsafe and voice their concerns, but they are reminded that they can leave if they do not like it. They are unhappy but get on with the job. Lower incidence of low severity, high frequency incidents but still high potential for high severity incidents.
Tolerant	Good knowledge of the process of risk assessment but not all hazards are identified. Supervisors involved in risk management with Safety Personnel.	Hazard identification is done using tools like Take 5's and Supervisors review high risk scores. Control measures applied but achievement of production targets leads to tolerance of high risks.	People voice their concerns about unsafe situations and Supervisors review, giving instructions to improve safety. People feel safer but might question the tolerance of high risk work continuing. Low incidence of low severity, high frequency incidents, with some potential for high severity incidents.
Aware	Sound knowledge of the process of risk assessment and all known hazards are identified and recorded in a risk register, with Management involvement.	Hazard identification is actively done by workers, Supervisors and Managers do walk-arounds and task observations. Visible leadership by Management includes engagement with workers about their understanding of the hazards and risk in their workplace. Control measures applied to reduce risks to a level acceptable for achievement of production targets to still occur.	People feel safe, because they feel valued. Management involvement boosts morale and people look out for each other. Low incidence of low severity, high frequency incidents, with low potential for high severity incidents.
Averse	Sound knowledge of the process of risk assessment and all known hazards are identified and recorded in a risk register, with Management actively involved in risk management process.	Hazard identification is actively done by workers, Supervisors and Managers do walk-arounds and task observations. Visible leadership by Management includes engagement with workers about their understanding of the hazards and risk in their workplace. Control measures applied to reduce risks. Achievement of production targets are secondary to safety objectives.	People feel safe, because they feel valued, but some frustration may set in, because work may slow down or be suspended for safety reasons. Management over-involvement may hamper progress and people may start taking chances, leading to an increase in the incidence of low severity, high frequency incidents, with increasing potential for high severity incidents.

It is believed that, rather than doing yet more research to define the concepts of organizational and safety culture and climate more accurately, the apparent connection between these concepts and the attitude towards risk justifies the need for future empirical research.

Conclusions

This review of published literature has revealed that safety climate and culture are significant aspects of safety performance in all organizations and that both are influenced by the leadership of senior management and other managers. There is, consensus amongst researchers and authors that the culture and climate of an organization are key determinants of organizational and safety performance. The awareness and understanding, which senior leaders, in particular, have with regards to the risks facing their organizations, has been identified as being potential drivers of organizational safety culture and safety climate. These abilities are derived from learning and experience, and enhanced by increasing and varied operational exposure, system knowledge and hazard identification skills.

Research conclusions were that a possible link exists between the attitude which organizational management has towards the risks which the organization may face and the resultant safety culture and climate. It could not be established whether risk awareness and understanding of management may have the same or a different effect to development of safety culture and climate in not-for-profit organizations. This was attributed to the fact that the only relevant literature found on this concept, pertained to the healthcare industry, specifically hospitals. It was also not very clear whether the hospitals referred to were privately owned, or government-funded, as only the government hospitals would be not for profit organizations.

Recommendations

The following recommendations flow from the research conducted and the findings, which have identified that:
1. Further, empirical research is required to investigate the potential of managerial risk awareness and understanding, acting as primary drivers of the development of organizational and safety climate and culture.
2. It was clear from the literature found on safety aspects in the healthcare industry that the focus was specifically on patient safety, rather than on staff safety or total hospital safety. This finding certainly prompts an opportunity for research into the potential of different risk approaches between corporate and not-for-profit organizations.
3. There is a clear case for education, training, coaching and mentoring programs, aimed specifically at organizational senior management, to include or place greater emphasis on understanding the concept of risk and its consequences for operational effectiveness and safety. Improved risk awareness should improve the nature and quality of decision-making, which should result in improved operational efficiencies and enhanced health and safety.

It is believed that the findings of this research can contribute to the understanding of the concepts of organizational and safety culture and climate, specifically from a risk awareness perspective. The implementation of the recommendations made and the anticipated improvements resulting from it should reveal in improved organizational and safety culture and climate.

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The WSO was founded in 1975 in Manila, The Republic of the Philippines, as a result of a gathering of over 1,000 representatives of safety professionals from all continents at the First World Safety and Accident Prevention Congress. The WSO World Management Center was established in the United States of America in 1985 to be responsible for all WSO activities, the liaison with the United Nations, the co-operation with numerous Safety Councils, professional safety/environmental (and allied areas) organizations, WSO International Chapters/Offices, Member Corporations, companies, groups, societies, etc. The WSO is a not-for-profit corporation, non-sectarian, non-political movement to "Make Safety a Way of Life…Worldwide."

World Safety Organization Activities

The WSO publishes WSO Newsletters, World Safety Journal, and WSO Conference Proceedings.

The WSO provides a network program linking various areas of professional expertise needed in today's international community.

The WSO develops and accredits educational programs essential to national and international safety and establishes centers to support these programs.

The WSO presents annual awards: the James K. Williams Award, Glenn E. Hudson International Award, J. Peter Cunliffe Transportation Award, WSO Concerned Citizen, WSO Concerned Professional, WSO Concerned Company/Corporation, WSO Concerned Organization, Educational Award, WSO Chapter/National Office of the Year, and Award for Achievement in Scientific Research and Development.

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The WSO has Chapters and National/International Offices located throughout the world, providing contact with local communities, educational institutions, and industrial entities.

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Associate Membership: Individuals connected with safety and accident prevention in their work or individuals interested in the safety field, including students, interested citizens, etc. **Affiliate Membership**: Safety, hazard, risk, loss, and accident prevention practitioners working as full time practitioners in the safety field. Only Affiliate Members are eligible for the WSO Certification and Registration Programs. **Institutional Membership**: Organizations, corporations, agencies, and other entities directly or indirectly involved in safety activities and other related fields. **Sustaining/Corporate Member**: Individuals, companies, corporations, organizations or other entities and selected groups, interested in the international effort to "*Make Safety A Way Of Life...Worldwide*."

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ethical and professional conduct in relationships
with clients, employers, associates, and the public.

୬•ഐ

Members must be responsible for professional competence
in performance of all their professional activities.

୬•ഐ

Members must be responsible
for the protection of professional interest,
reputation, and good name of any deserving WSO member
or member of other professional organization
involved in safety or associate disciplines.

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Members must be dedicated to professional development
of new members in the safety profession
and associated disciplines.

୬•ഐ

Members must be responsible
for their complete sincerity in professional service
to the world.

୬•ഐ

Members must be responsible for continuing improvement
and development of professional competencies
in safety and associated disciplines.

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