DEVELOPING A PSYCHOMETRIC SCALE TO MEASURE ORGANISATION'S SAFETY CLIMATE

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ABSTRACT
The aim of this study was to develop a non-specific industry psychometric instrument to measure occupational safety climate in organisations. The objectives were to identify and select factors/dimensions considered fundamental in predicting organisations' safety climate; generate items for selected factors; determine the reliability and validity of the instrument developed; and establish the normative values for the application of the instrument. Flowing from the objectives, one major research question was posed, and one hypothesis postulated. Stage one of the study was used for items generation and factors determination, while stage two established the reliability and validity of the instrument as well as its normative psychometric values for its application in organisations. Using convenience and stratified sampling techniques, a total of 540 (304 males and 236 females) participants were selected for the study. The psychometric properties of the instrument were obtained having subjected the participant's scores to factor analysis and concurrent validation respectively. The study results indicated that Dimension of Occupational Safety Climate Inventory–5 (DOSCI-5), with its five dimensions and 57 items, is valid and reliable in measuring organisations' safety climate.

Keywords: ***Occupational safety, dimensions, psychometric scale, reliability, validity.***

INTRODUCTION
Safety climate is the shared perceptions about safety policies, procedures and practices in an organisation (Zohar, 2011). Safety climate is a fundamental indicant of organisation's safety performance employed in determining or predicting output of management and employees' safety policy and behaviours as they affect occupational accidents, injuries and illnesses. A specific occupational safety climate is a convergent of employees' perceptions of relevant policies, procedures, and practices in their organisation. Over the last 25 years, researchers have come up with instruments to assess safety climate in organisation. Since Zohar developed the first instrument in 1980 there have not been acceptable standardised psychometric instruments to measure organisational safety climate; this can be explained by the fact that various instruments developed have been industries-specific (Cox & Cox, 1991; Niskanen, 1994; Diaz & Cabrera, 1997; Lee, 1998). Majority of instruments developed have been customised to key into the requirements of organisations sponsoring such instruments. Another problem is that many of the safety instruments developed are lacking in concordant theoretical model, while the case of validity and reliability are yet to be satisfactorily treated in the instruments developed (Flin, *et al*., 2000).

This study attempted to develop a psychometric scale that cuts across disciplines and therefore could be applied to measure organisations' safety climate as perceived by employees.

Aim and Objectives of the Research
The general aim of this study was to develop a non-specific industry psychometric instrument for measuring organisations' occupational safety climate.

The study objectives were to:

1. identify and select factors/dimensions considered fundamental in predicting organisations' safety climate;
2. generate items for selected factors;
3. determine the reliability and validity of the instrument developed; and
4. establish the normative values for the application of the instrument.

Research Questions

The major question the study sought to answer was:
Will the new safety climate instrument – Dimension of Occupational Safety Climate Inventory-5 (DOSCI-5) have high reliability and validity to measure organisations' safety climate?

Research Hypotheses

DOSCI-5 will have high reliability and validity coefficients to measure organisations' occupational safety climate.

LITERATURE REVIEW

Theoretical Concept

One strong theory of safety concept is that, which can be hinged on Bandura's Social Cognitive Theory (Bandura, 1986) which posits that human behaviour is caused by personal, behavioural and environmental influences. The fundamental premise of social cognitive theory is that individuals learn through their own experiences, by observing other people's actions, and the consequences of those actions. Organisational safety climate is therefore a social cognitive construct which is, in part, an active process rather than a passive observation of organisational formal procedures as well as isolated practices as it relates to the employee (Drazin,Glynn, & Kazanjian, 1999; Weick, 1995). According to Zohar (2003a), ranking of roles dimensions will indicate to employees safety behaviours likely to be accepted and rewarded by management in the process of discharging their duties, and in particular, when the employees are confronted with conflicting demands to meet set targets.

Reliability

Reliability refers to the consistency, stability and repeatability of the results of a given measure, experiment or research (Twycros & Shields, 2004). Reliability implies the degree to which the results obtained from the given measure and procedures are replicable. Lack of reliability arising from different reasons will ultimately affect the validity of the instrument for such measure. Three types of reliability have been identified: stability, equivalence, and internal consistency, otherwise referred to as homogeneity. Stability answers the question, if the measured applied repeatedly on the same individual or respondent will yield similar result or results. Equivalence addresses the question of whether the measure employed by different researchers will produce similar results. Homogeneity addresses the issue of internal consistency in the research, that is, if different operational definition of the same concept applied on the same respondent or individual, with the same data-collection method will produce a highly correlated result.

Validity

Validity refers to the extent to which a given instrument measures what it is intended to measure (Thatcher, 2010). To determine this, there are levels of validity such measure or research must achieve: face validity, content validity, construct validity, and criterion-

related validity. Face validity refers to the degree to which a test appears to measure what it purports to measure at face value. Content validity is that type that addresses how well the items developed to operationalise a particular construct provide adequate and representative samples of all the items to measure the construct in focus (Kimberlin & Winterstein, 2008). Experts' judgment is usually depended upon in content validity. Construct validity examines the relationship of the measure being evaluated with known variables or variables related to the construct measured by the instrument. Criterion-related validity furnishes evidence of the extent to which the scores on the new measure or instrument correlate with other measure or instrument of the same construct, or with very closer construct. Hence, criterion-related validity is also referred to as predictive validity.

Conceptual Review

Measuring safety performance in organisation has not been an easy task since the first research by Zohar in 1980. Individual researchers have addressed the areas thought to be important to safety performance in organisation using dimensions. This has further prevented unifying structures and factors for determining the acceptable constructs for developing psychometric scales for measuring organisation's safety performance. In spite of the many studies that have been carried out on safety climate in organisations, researchers are yet to arrive at common agreement on safety climate (Hecker & Goldenhar, 2013). However, literature review reveals that the most common safety climate is management commitment to safety.

Zohar in his first research in 1980 had eight dimensions: *importance of safety training programmes, management attitudes toward safety, effects of safe conduct on promotion, level of risk at workplace, effects of required work pace on safety, status of safety officer, effects of safe conduct on social status, status of safety committee* (Zohar, 1980). Brown & Holmes (1986) in their research used *management concern, management activity, risk perception* as the dimensions they investigated. Budworth (1997) considered *management commitment, supervisor support, safety systems, safety attitudes, safety representatives* as important dimensions in organisation's safety performance. Cheyne et al. (2002) had seven dimensions consisting of *communication, individual responsibility, safety standards and goals, personal involvement, workplace hazards, physical work environment.* Cooper (1995) had eleven dimensions: *management commitment, management actions, personal safety commitment, perceived risk levels, effects of work pace, belief about accident causation, effects of job induced stress, safety communication, emergency procedures, safety training, and role of safety representatives.*

In their own research, Cox & Cheyne (2000) had nine dimensions: *management commitment, priority of safety, communication, safety rules, supportive environment, involvement in safety, personal priorities and need for safety, personal appreciation of risk, work environment.* Cox & Cox (1991) had *personal skepticism, individual responsibility, work environment, safety arrangements, and personal immunity.* For Dedobbeleer & Beland (1991), two dimensions were just enough, and they were: *management commitment, worker involvement.*

Flin, Mearns, O'Connor & Bryden (2000) carried out a review of eighteen researches into safety climate dimensions to identify common features in them. They concluded that the most common themes assessed in safety climate questionnaires are: management in 13 studies, and supervision in four studies; safety system in 12 studies; risk in 12 studies; work pressure in six studies; and competence in six studies.

From the above, it becomes apparent that areas or dimensions considered or tacitly agreed upon by researchers as crucial in predicting organisation's safety climate are: (1) management/supervisors commitment to safety (2) workers' perception about their organsation's commitment to safety (3) workers' involvement in safety policy development and implementation (4) identifiable organisational safety policy (5) work pressure, among others. Four of the dimensions above were parts of the five dimensions used in the development and standardisation of the instrument in this study

METHODOLOGY

The study was carried out in two stages. The first stage was generation of constructs germane to the concepts of safety climate as shared perception of safety policies, procedures and practices in organisation. This was followed by exploratory analysis of the scores generated with the items to establish the five factors/dimensions used in the instruments. The second stage was determining the validity and reliability of the instrument, and establishing the normative values for its application in organisation to measure safety climate.

Stage I

Items Generation Procedure

In order to generate items with high content validity for the instrument, the researcher had interaction with some part-time executive post-graduate students of the University of Lagos seeking their views and perception of occupational safety climate of their various organisations. Furthermore, the research went through some relevant literatures on instrument design for occupational safety climate. International Labour Organisation (ILO) policies and guidelines on occupational safety was reviewed, particularly, Occupational Safety and Health Act of 2005 which all subscribing member nations ought to have passed into law. The analysis of the Act was also reviewed. The researcher further reviewed Occupational Safety and Health Authority's (OSHA, United States of America) policies, guidelines, requirements from organisations, inspection procedures, employees' right to safe work environment as a matter of right, the role of workers in enforcing safe working environment as provided by the Law, and sanctions for erring organisation, among others. The researcher reviewed the works of some authors that have researched into dimensions of occupational safety. From the above, the researcher was able to generate relevant 74 items divided into five dimensions: Management/Supervisor Commitment to Safety (15 items); Meeting the Baseline for Occupational Safety (18 items); Workforce Perception About Safety (17 items); Employees' Involvement in Safety (10 items); and Work Pressure (14 items). Five experts assessed the items for their face validity.

Sample Technique

A combination of convenience and stratified sampling techniques was used to select the participants in this stage.

Study Location

The study was carried out among workers from various industries and professions in the public and private sectors in Lagos, South-West, Nigeria. These were workers undergoing part-time post-graduate programmes in different departments in the University of Lagos during the 2014/2015 session.

Sample Selection and Characteristics

The study population consisted of workers in both public and private sectors (junior, middle, and senior levels) working in 74 different industries, and in various professions. The task at this stage was to establish the communalities of the items generated and factor loadings of the five factors to be extracted through exploratory factor analysis. Determining sample size that is likely to produce factor structure solution that closely matches intended population, Comrey & Lee (1992) suggested the following guideline: 50 – very poor, 100 – poor, 200 – fair, 300 – good, 500 – very good, and 1,000 or more – excellent. However, some other researchers opined that sample sizes from 100 to 400 will be sufficient for exploratory factor analysis (MacCallum, Widaman, Zhang & Hong, 1999; Hutcheson and Sofroniou, 1999; Norusis, 2005; David Garson, 2008). Therefore, a total of 450 questionnaires were distributed to the target samples for this stage of the study. A total of 378 (three hundred and seventy-eight) were found usable from the numbers returned. This represents 84% of the questionnaires sent out, and it is considered very high. The 378 respondents consisted of 217 males and 161 females. The responses were scored according to the key provided by this researcher, and the scores thereafter were subjected to factor analysis.

Stage 2

Stage 2 of this study was to establish the validity and reliability of the instrument as a component, and its five factors.

Study Location

The location for the study was the University of Lagos Campus (Main Campus and Yaba Campus). Participants were matured working class part-time students attending programmes in Master in Business Administration (MBA), Master in Public and International Affairs (MPIA II) and Master in Project Management; they cut across 50 different industries.

Sample and Sampling Technique

Purposive and stratified sampling techniques were adopted in selecting samples for this stage. Two sets of instruments were used at this stage: the new instrument being developed, and another standardised instrument for measuring safety climate. A total of 300 sets of instruments were sent out, 220 were retrieved – that is 73% - while 162 were usable consisting of 87 males and 75 females. KMO and Bartlett's Test of Sphericity confirms the adequacy of this sample at .829

Research Design

The research design was correlational to establish the criterion-related validity of the instrument using concurrent validation method.

Instruments

(a) ***Personal Data Form***: This was used to collect relevant background and personal information (bio-data) of the participants.

(b) ***Dimensions of Occupational Safety Climate Inventory****-5* ***(DOSCI-5)***:This is the new instrument with five subscales developed to measure occupational safety climate. It consists of 57 items and on a 5-point Likert rating scale. The scale ranges from 1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, and 5 = Strongly Agree. Scoring participants' responses requires direct and reverse scoring of the circled numbers by participants. Participant's total score in both the subscale and the entire

instrument as a component is determined by adding both the total of direct and the reverse scores together.

(c) ***Safety Management Practices Questionnaire (SMPQ) (Osuagwu, Sote & Omoluabi, 2005)***:This is a 55-item of nine scales designed to measure safety performance in organisations by the authors. SMPQ has Cronbach Alpha internal consistency reliability coefficient of 0.87, Spearman-Brown (odd-even) reliability co-efficient of 0.91 and Guttman Split-half of 0.91. The instrument also has a concurrent validity coefficient of 0.83 with Offshore Safety Questionnaire (OSQ) developed by Rundmo (1994)

Data Analysis

The data collected were analysed using IBM Statistical Package for Social Sciences (SPSS) Version 20. Descriptive and inferential statistics were used to obtain the norms for the new scale as a component and for each of the subscales as well. Cronbach alpha reliability, Guttman split-half coefficient, and Spearman-Brown coefficient were used to establish reliability, while concurrent validity was established using Pearson Product Moment correlation statistics.

RESULTS

Exploratory Factor Analysis

In order to determine the construct validity of the instrument, Exploratory Factor Analysis of the initial 74 items with five factors was performed using Principal Component Analysis (PCA) with orthogonal rotation (Varimax). The Kaiser-Meyer-Olkin measure of sample adequacy was confirmed at KMO = .83. This is considered great according to Field, (2009). Bartlett's test of sphericity $\chi 2\ (270) = 8446.459$, $p < .001$ was obtained. This indicated that the correlations between the items were sufficiently large for the PCA. Tables below reveal the results of the analysis.

Table 1.0: Total Variance Explained for DOSCI-5 Factors

Factors (Components)	Rotation Sums of Squared Loadings		
	Eigenvalue (Total) %	% of Variance	Cumulative
1	14.227	19.226	19.226
2	4.856	6.562	25.788
3	2.808	3.795	29.584
4	2.308	3.118	32.702
5	2.103	2.842	35.544

Extraction Method: Principal Component Analysis

The communalities table, Table 2.0, reveals the internal correlations among the items and their factor loadings that determined those items that were retained. It also determined clusters of the items into five factors.

Table 2.0: Items, Communalities and Their Factor Loadings

ITEMS	Communalities

				FACTOR LOADINGS				
				Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Eigen – values				14.227	4.856	2.808	2.308	2.103
Percentage of variance explained				19.226	6.562	3.795	3.118	2.842
Cumulative percentage variance explained				19.226	25.788	29.584	32.702	35.544
Reliability (Cronbach Alpha)				.858	.870	.836	.891	.421
Management/Supervisor Commitment to Safety								
1.	item57	Workers are involved in safety and health decision making-policies in my organisation	.964	**.655**				
2.	item59	Management conducts safety and health demonstrations for workers regularly in my organisation	.941	**.636**				
3.	item55	There are regular meetings between workers' representatives and management on safety and health in my organisation	.890	**.635**				
4.	item47	Management provides safety procedures manual for workers in my organisation	.862	**.624**				
5.	item56	There is no adequate safety and health communication issues and programmes between management and workers in my organisation	.901	**.607**				
6.	item50	Management regularly rewards good safety behaviours among workers in my organisation	.905	**.594**				
7.	item53	Some officers are put in charge of safety and health in my organisation	.921	**.585**				
8.	item33	Induction training for new employees covers sufficient basics on safety and health at work in my organisation	.936	**.527**				
9.	item54	Workers are not members of my organisation's safety and health committee	.883	**.519**				
10.	item31	My organisation would insist that equipment/working tool is designed and produced to be safely used by its workers before purchase	.915	**.518**				

11.	item48	There is an effective safety committee in my company	.959	**.503**				
12.	item28	Employees in my organisation are enthusiastic about safety and health training programmes	.944	**.498**				
13.	item32	My organisation ensures all materials, equipment, machine and tools conform to international standard before purchase for worker's use	.878	**.493**				
14.	item52	Some workers are trained in safety and health in the workplace	.860	**.468**				
15.	item51	Workers are not involved in safety and health matters in my organisation	.946	**.451**				
16.	item17	My organisation ensures proper training for employees before they operate any machine/instrument/equipment	.920	**.449**				
17.	item34	Safety and health in the workplace is being too exaggerated	.877	**.446**				
18.	item18	My organisation tests the physical fitness of employees before assigning them to perform tasks	.944	**.445**				
19.	item30	Workers in my company would continue to manage defective equipment/machine/instrument rather than insisting on its repair or replacement	.901	**.443**				
20.	item10	Management personnel or their representatives regularly visit workers' sight/environment to assess level safety practice by employees	.937	**.443**				
21.	item29	In my company, workers do not care about safety training	.904	**.438**				
22.	item19	My organisation does not tests for psychological fitness of employees before assigning them to tasks	.959	**.426**				
Meeting the baseline for occupational safety								

23.	item5	My company does not have safety and health committee	.914		**.686**			
24.	item8	Nobody seems to care about the safety and health of employees at work in my organisation	.927		**.682**			
25.	item9	My organisation does not commit sufficient financial resources to safety and health of workers	.943		**.664**			
26.	item2	My organisation has a safety and health committee that monitors safety and health compliance	.899		**.640**			
27.	item1	My organisation has identifiable safety and health policy that guide its employees	.927		**.629**			
28.	item3	My company has a system of recording accidents, injury or fatality that occur in the course of duty performance	.948		**.624**			
29.	item22	My organisation has emergency clinic in case of accident or emergency incident	.931		**.558**			
30.	item12	Management is not aware of government safety legislations in my industry	.960		**.553**			
31.	item23	We have sufficient emergency exits in my organisation in case of incident requiring emergency mass exit.	.939		**.528**			
32.	item21	There is not enough lighting and ventilation in my office while at work	.923		**.504**			
33.	item13	My organisation organises regular safety training programmes for its employees	.898		**.503**			
34.	item4	Safety and health inspectors come to my organisation periodically to audit its safety and health system	.921		**.490**			
35.	item14	My organisation's employees are given relevant personal protective equipment/wears for their safety and health.	.903		**.488**			
36.	item24	Workers are not trained on emergency response strategies in case of emergency safety incident.	.820		**.453**			
	item15	Management in my organisation penalises employees			**.420**			

37.		that breach safety policies.	.897					
38.	item6	My organisation is little bothered about the safety and health of its employees	.959		**.420**			
Workforce perceptions about safety								
39.	item72	I feel the workload I am made to perform is too much for me	.903			**.682**		
40.	item65	I am given too many tasks to perform at a time	.885			**.678**		
41.	item73	Because of too much work, I have not gone for training in the last two years	.941			**.669**		
42.	item71	I feel depressed every morning when I am coming to work	.911			**.594**		
43.	item74	Most times, I work for longer hours	.889			**.572**		
44.	item64	My supervisor always breathes over my neck to ensure I perform my task	.932			**.552**		
45.	item66	My colleagues cannot cope with my working pace	.882			**.498**		
46.	item69	Because of volume of work, I am made to forgo my annual leave most of the time	.884			**.456**		
Employees' involvement in safety								
47.	item46	There are no visible safety instructions within the entire organisation	.937				**.603**	
48.	item43	I have never seen any safety and health inspector come to inspect the safety policy and performance of my organisation	.934				**.584**	
49.	item45	I am not aware of any government regulations about safety and health in the workplace	.916				**.536**	
	item44	Workers cannot demand for their safety at work as a					**.523**	

50.		right in my organisation	.954					
51.	item42	My organisation does not have adequate insurance cover for workers in case of accident and injury or death	.939				**.489**	
52.	item49	Management considers funds spent on safety and health prevention as eating too much into the organisation's profit	.857				**.465**	
53.	item41	Most times, workers are asked to manage defective equipment/machine/instrument to perform task in my organisation	.919				**.449**	
54.	item58	I have never attended any training on safety and health in the workplace	.894				**.412**	
Work Pressure								
55,	item61	I work to meet deadlines everyday	.812					**.656**
56.	item62	I have to keep pace with work process so as not to delay production/service	.897					**.606**
57.	item20	Employees are exposed to too much noise in my organisation during operations	.888					**.515**

*Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation. (Numbers in **bold** face indicate factor loadings)*

According to Guadagnoli & Velicer (1988), factors with 10 or more loadings greater than .40 are reliable, however, with sample size that is more than 300, factors with lower loadings could be considered, they concluded. Furthermore, Steven (2002) factor loading table considered 300 sample size with 0.298 factor loading as acceptable. Therefore, with the 378 sample size of this study, factor loading > 0.4 selected for the new instrument was considered reasonable. It was also noted that few items loaded under two factors; in this instance, the higher values were picked under relevant factors while the lower figures were discarded. The factor loading therefore reduced the items from 74 to 57 under the five components. The communalities table shows the internal correlations among the items and also determines clusters of the items into five factors. This indicates that linear components exist with the set of data and how variables contribute to the components (Dunteman, 1989).

Validation of DOSCI-5

Table: 3.0 below contains the results of the validation of DOSCI-5 in relation to its means as a component instrument and its subscales, including their reliabilities.

Table 3.0: DOSCI-5 Means, Standard Deviation and Reliabilities

Scales	Nos of Items	Mean*Male*	Mean *Female*	Mean *(Male &Female)*	SD	Reliabilities	
						Alpha	Split-Half
Management/Supervisor Commitment to Safety	22	72.37	71.59	72.0	15.96	.858	.810
Meeting Baseline of Occupational Safety	16	52.53	52.95	52.72	11.11	.870	.826
Workforce Perception About Safety	8	27.40	27.42	27.41	6.54	.836	.781
Employees' Involvement in Safety	8	26.32	26.95	26.61	7.66	.891	.841
Work Pressure	3	8.67	9.36	8.99	2.45	.421	.068
DOSCI-5	57	187.9	188.2	188.1	36.99	.927	.770

*N=162; *p<0.05, **p<0.01*

Management/Supervisor's commitment to safety has the highest means for male (72.37), female (71.59), and male/female combined (72.0). This is followed by Meeting Baseline of Occupational Safety, Workforce Perception About Safety, Employees' Involvement, and Work Pressure respectively. The instrument as a component has the means for male 187.9, female 188.2, and male/female combined 188.1.

Reliability

Dimensions of Occupational Safety Climate Inventory- 5 (DOSCI-5) is reliable with Cronbach Alpha internal consistency reliability coefficient of .93, Guttman Split-half coefficient of .77 and Spearman-Brown coefficient of .78. The instrument five subscales also show Cronbach alpha reliability coefficients of 0.86, 0.87, 0.84, 0.89, and 0.42 respectively. Spearman-Brown Split-have coefficients of the five subscales also stand at .81, .83, .78, .84, and .07 respectively. These figures indicate that the instrument as a measuring scale is reliable, while the subscales are also reliable.

Validity

Safety Management Practices Questionnaire (SMPQ) was used along with the new instrument, Dimensions of Occupational Safety Climate Inventory-5 (DOSCI-5) to obtain the concurrent validity of the instrument. A concurrent validity co-efficient of $r = .56$, p *(two-tailed)* $<.01$, $n = 162$ was obtained.

Therefore the hypothesis that the new instrument, DOSCI-5, will have high reliability and validity coefficients to measure organisations' occupational safety climate is confirmed and is hereby accepted.

DISCUSSION

This research set out to develop a psychometric instrument to measure organisations' safety climate. In order to achieve the aim, the study was carried out in two stages: items generation and factors identification; and establishing reliability and validity, as

well as determining the normative values for the application of the instrument in organisations. The Dimensions of Occupational Safety Climate Inventory-5 (DOSCI-5) developed in this study was found to be reliable and valid an instrument to measure occupational safety climate of organisations. The Dimensions of Occupational Safety Climate Inventory-5 (DOSCI-5) developed in this study was factored into five dimensions. This conforms to the suggestions of organisational theorists that assessment of occupational safety climate is better approached through dimensions as done in this study (Adutwum, 2012). The Kaiser-Meyer-Olkin used to measure the instrument's sampling adequacy was above .83, and Bartlett's Test of Sphericity for the instrument produced approximate Chi-Square of 8446.46 , df=2701, at p<.001. This is considered great according to Field (2009). Thus the psychometric property of DOSCI-5 is adequate and sufficient to measure the variable for which it was developed – occupational safety climate in organisations.

CONCLUSION

The Dimension of Occupational Safety Climate Inventory- 5 (DOSCI-5) developed and validated with high quality psychometric properties in this research, and for the purpose of measuring organisational safety climate has proved to be a useful instrument in assessing organisation's safety climate through the results that the research generated.

Recommendation

Based on the results and conclusions from this study, the following recommendations are proffered for the application of the results from this study:

1. The instrument developed for this study, Dimension of Occupational Safety Inventory – 5 (DOSCI-5) should be used and standardized by future researchers in occupational safety climate.
2. Future researchers could use the instrument to measure safety climate in different industries concurrently to establish its general applicability.

Contribution to Knowledge

This study has contributed significantly to knowledge in the following ways:

1. The psychometric instrument developed in this study, Dimensions of Occupational Safety Climate Inventory -5 (DOSCI-5) has joined the body of other instruments for measuring organisations' occupational safety climate.
2. The instrument joined the body of other non-industry-specific psychometric instrument to measure safety climate in organisations.

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