

### EFFECTIVENESS OF A WORK SAFETY CULTURE AND HEALTH EDUCATION MODULE IN IMPROVING OFFICE-RELATED ERGONOMICS OF PUBLIC SECTOR ADMINISTRATIVE WORKERS IN ABEOKUTA, NIGERIA



ODU JOSIAH OLUWASEUN

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

### EFFECTIVENESS OF A WORK SAFETY CULTURE AND HEALTH EDUCATION MODULE IN IMPROVING OFFICE-RELATED ERGONOMICS OF PUBLIC SECTOR ADMINISTRATIVE WORKERS IN ABEOKUTA, NIGERIA

By

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August 2022

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Studies have shown that a workplace safety culture (WSC) is lacking among the general workforce in Nigeria. Poor WSC can result in adverse impacts on workers' health and high remedial costs for employers. To improve WSC, workers need to improve on knowledge, attitude, and practices related to office ergonomics towards WSC through effective health interventional programs at the workplace.

The study aimed to develop, implement and evaluate the effectiveness of the Work Safety Culture Health Education Module (WSCHEM) among government administrative workers in Abeokuta, Southwestern Nigeria.

The study was a two-armed, single-blinded cluster randomized controlled trial involving 247 public sector administrative workers from clusters of 20 ministries in Abeokuta, Southwestern Nigeria. The intervention group was given WSCHEM, whereas the waitlist group received a seminar on team building and leadership skills and received the WSCHEM after the intervention program ended. The researcher administered the module to the intervention group. For the waitlist group, one of the research assistants from the ministry of finance delivered the seminar on team building and leadership skills for morning and afternoon sessions. The evaluation was done three times using the first formal validated, self-administered Work Safety Culture Questionnaire (WSCQ) among the administrative workers: first at baseline, second at one month, and third at three months post-intervention. The validation of the Work Safety Culture Questionnaire (WSCQ) confirmed high reliability and validity for the evaluation of the level of knowledge, attitude, and practices toward work safety culture (WSC) among the study population. The respondents' knowledge, attitude, and practices toward work Safety Culture Questionnaire safety culture (WSC) was measured using the Work Safety Culture Questionnaire safety culture (WSC) was measured using the Work Safety Culture Questionnaire safety culture (WSC) was measured using the Work Safety Culture Questionnaire safety culture (WSC) was measured using the Work Safety Culture Questionnaire safety culture (WSC) was measured using the Work Safety Culture Questionnaire safety culture (WSC) was measured using the Work Safety Culture Questionnaire safety culture (WSC) was measured using the Work Safety Culture Questionnaire safety culture (WSC) was measured using the Work Safety Culture Questionnaire safety culture (WSC) was measured using the Work Safety Culture Questionnaire safety culture (WSC) was measured using the Work Safety Culture Questionnaire safety culture Questionnaire safety culture Questionnaire saf

(WSCQ). Data obtained was analyzed by using the IBM SPSS Statistics 25. Chi-Square Test was used for bivariate analysis, and Generalized Estimating Equations (GEE) for the multivariate analysis.

The results showed no statistically significant differences between groups regarding the respondents' characteristics (socio-demographic and occupational/office related ergonomic factors) and the outcome variables (knowledge attitudes and practices) on WSC at baseline. For practices towards WSC, both intervention ( $\beta$  6.8, 95%CI 4.85, 8.72) and time ( $\beta$  6.2, 95%CI 4.49, 7.94) had a statistically significant effect on the respondents' practices towards WSC in the per-protocol analysis. In the secondary outcomes, both knowledge of WSC, intervention ( $\beta$  3.5, 95%CI 2.8, 4.2) and time ( $\beta$  3.4, 95%CI 2.7, 5.9) and attitudes towards WSC, intervention ( $\beta$  1.7, 95%CI 1.25, 2.23) and time ( $\beta$  2.3, 95%CI 1.92, 2.76) had a significant effect on the respondents' level of knowledge and attitudes respectively towards WSC.

The WSCHEM effectively improved respondents' knowledge, attitude, and practices related to office ergonomics (which are exercising, using computer screen cover, not sitting in one position for a long time, and attending office ergonomic course) toward work safety culture. Employers are encouraged to adopt WSCHEM as an adjunct to their workplace's pre-existing control measures to improve their workers' knowledge, attitude, and practices toward work safety culture.

Keywords: Administrative workers; Office workers; Work Safety Culture; Health Education; Knowledge, Attitude, and Practices towards Work Safety Culture

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

### KEBERKESANAN MODUL BUDAYA KESELAMATAN KERJA DAN PENDIDIKAN KESIHATAN DALAM MENINGKATKAN ERGONOMI BERKAITAN PEJABAT PEKERJA PENTADBIRAN SEKTOR AWAM DI ABEOKUTA, NIGERIA

Oleh

## ODU JOSIAH OLUWASEUN

**Ogos 2022** 

### Pengerusi : Titi Rahmawati binti Hamedon, MD, MCommH Fakulti : Perubatan dan Sains Kesihatan

Kajian telah menunjukkan bahawa budaya keselamatan tempat kerja (WSC) kurang dalam kalangan tenaga kerja am di Nigeria. WSC yang lemah boleh mengakibatkan kesan buruk kepada kesihatan pekerja dan kos pemulihan yang tinggi untukmajikan. Untuk menambah baik WSC, pekerja perlu menambah baik pengetahuan, sikap dan amalan berkaitan WSC, melalui program intervensi kesihatan yang berkesan di tempat kerja.

Kajian itu bertujuan untuk membangun, melaksana dan menilai keberkesanan Modul Pendidikan Kesihatan Budaya Keselamatan Kerja (WSCHEM) dalam kalangan pekerja pentadbiran kerajaan di Abeokuta, Barat Daya Nigeria.

Kajian itu adalah percubaan terkawal rawak kelompok dua bersenjata, buta tunggal yang melibatkan 247 pekerja pentadbiran sektor awam dari kelompok 20 kementerian di Abeokuta, Barat Daya Nigeria. Kumpulan intervensi diberi WSCHEM, manakala kumpulan senarai menunggu menerima seminar mengenai pembinaan pasukan dan kemahiran kepimpinan dan menerima WSCHEM selepas program intervensi tamat. Pengkaji mentadbir modul kepada kumpulan intervensi. Bagi kumpulan senarai menunggu, salah seorang pembantu penyelidik dari kementerian kewangan telah menyampaikan seminar pembinaan pasukan dan kemahiran kepimpinan dilakukan sebanyak tiga kali menggunakan Soal Selidik Budaya Keselamatan Kerja (WSCQ) yang disahkan secara rasmi dan ditadbir sendiri di kalangan pekerja pentadbiran: pertama pada peringkat awal, kedua pada satu bulan, dan ketiga pada tiga bulan selepas intervensi. Pengesahan Soal Selidik Budaya Keselamatan Kerja (WSCQ) mengesahkan kebolehpercayaan dan kesahan yang tinggi iv untuk penilaian tahap pengetahuan, sikap, dan amalan terhadap budaya keselamatan kerja (WSC) dalam



kalangan populasi kajian. Pengetahuan, sikap dan amalan responden terhadap budaya keselamatan di tempat kerja (WSC) diukur menggunakan Work Safety Culture Questionnaire (WSCQ). Data yang diperolehi dianalisis dengan menggunakan IBM SPSS Statistics 25. Ujian Chi-Square digunakan untuk analisis bivariat dan Generalized Estimating Equations (GEE) untuk analisis multivariate.

Keputusan menunjukkan tiada perbezaan yang signifikan secara statistik antara kumpulan mengenai ciri-ciri responden (faktor ergonomik berkaitan sosiodemografi dan pekerjaan/pejabat) dan pembolehubah hasil (sikap dan amalan pengetahuan) pada WSC pada garis dasar. Bagi amalan terhadap WSC, kedua-dua intervensi ( $\beta$  6.8, 95%CI 4.85, 8.72) dan masa ( $\beta$  6.2, 95%CI 4.49, 7.94) mempunyai kesan yang signifikan secara statistik ke atas amalan responden terhadap WSC dalam analisis per-protokol. Dalam hasil sekunder, kedua-dua pengetahuan WSC, intervensi ( $\beta$  3.5, 95%CI 2.8, 4.2) dan masa ( $\beta$  3.4, 95% CI 2.7, 5.9) dan sikap terhadap WSC, intervensi ( $\beta$  1.7, 95% CI 1.25, 2.23) dan masa ( $\beta$  2.3, 95%CI 1.92, 2.76) mempunyai kesan yang signifikan terhadap tahap pengetahuan dan sikap responden terhadap WSC.

WSCHEM secara berkesan meningkatkan pengetahuan, sikap dan amalan responden (yang bersenam, menggunakan penutup skrin komputer, tidak duduk dalam satu kedudukan untuk masa yang lama dan menghadiri kursus ergonomik pejabat) ke arah budaya keselamatan kerja. Majikan digalakkan untuk mengguna pakai WSCHEM sebagai tambahan kepada langkah kawalan sedia ada di tempat kerja mereka untuk meningkatkan pengetahuan, sikap dan amalan pekerja mereka terhadap budaya keselamatan kerja.

Kata kunci: Pekerja pentadbiran; Pekerja pejabat; Budaya Keselamatan Kerja; Pendidikan Kesihatan; Pengetahuan, Sikap, dan Amalan terhadap Budaya Keselamatan Kerja

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# LIST OF ABBREVIATIONS

AW	Administrative Worker
CF	Confounding Factors
CITC	Corrected Item-Total correction
CRCT	Cluster Randomized Controlled Trial
CVS	Computer Vision Syndrome
DV	Dependent Variables
FCT	Federal Capital Territory
GDP	Gross Domestic Product
GEE	Generalized Estimating Equation
GM	Government ministries
HBM	Health Belief Model
IG	Intervention Group
ILO	International Labor Organization
IMB	Information Motivation and Behavior
IQR	Interquartile Range
ITT	Intention to treat
IV	Independent Variables
JKEUPM	Jawatankuasa Etika Universiti Putra Malaysia
КАР	Knowledge Attitude and Practice
LBP	Low Back Pain
LOCF	Last Observation Carried Forward
MCAR	Missing Completely at Random
MetS	Metabolic Syndrome

- NNBS Nigeria National Bureau of Statistics
- NSITF Nigeria Social Insurance Trust Fund
- OSH Occupational Safety and Health
- OW Office Worker
- PP Per-protocol
- PRISMA Preferred Reporting Items for Systematic Reviews and Meta-Analysis
- QIC Quasi Likelihood
- QICC Corrected Quasi Likelihood
- ROM Range of Motion
- SPSS Statistical Package for Social Sciences software
- TPB Theory of Planned Behavior
- TRA Theory of Reason Action
- TTM Trans-theoretical Model
- UN United Nations
- UPM Universiti Putra Malaysia
- VDT Visual Display Terminal
- WG Waitlist Group
- WHO World Health Organization
- WRDs Work-Related Deaths
- WSC Work Safety Culture
- WSCHEM Work Safety Culture Health Education Module
- WSCQ Work Safety Culture Questionnaire

#### CHAPTER 1

#### **INTRODUCTION**

#### 1.1 Background

The right of workers in all countries is to be well informed, educated, and trained on workplace safety culture (WSC). Therefore, health education or health training is commonly used to prevent occupational health problems (diseases, risks, and accidents) by increasing knowledge, improving attitude, and promoting good practices related to office ergonomics towards WSC among office workers (Pourhaji et al, 2016). Furthermore, based on the worker health global plan of action, the World Health Organization (WHO) strongly encourages the education of workers, employers, primary care practitioners, and professionals for occupational services. All organizations must integrate workers' health into basic healthcare training (Worker Health Global Plan of Action, WHO 2007).

Intervention programs that showed improvement in knowledge, attitude and practices related to office ergonomics towards WSC are still lacking among office workers around the globe. However, intervention studies on occupational health problems (diseases, risks, and accidents) among office workers showed that having a high knowledge, a positive attitude and good practices related to office ergonomics towards WSC is directly associated with the level of office workers' exposure to occupational health problems at the workplace (Pourhaji et al, 2016, Chandwani et al, 2019 & Sohrabi, & Babamiri, 2022). Therefore, knowledge, attitude, and practices related to office ergonomics towards WSC are important concepts that office workers need to create workplace safety awareness in their respective organizations. It helps reduce office workers' exposure to occupational injuries, accidents, and diseases. In addition, a better WSC improves workers' productivity (Pourhaji et al, 2016, Chandwani et al, 2019 & Sohrabi & Babamiri, 2022). Therefore, in developing effective interventions on knowledge, attitude, and practices towards WSC, there is a need to investigate how these interventions increase knowledge, improve attitude, and promote good practices related to office ergonomics towards WSC among office workers.

Besides affecting the office workers' productivity and causing immeasurable human suffering, such as illnesses and accidents, poor WSC can cause significant financial loss to employees and the government. The economic burden and cost of occupational health problems (diseases and accidents) are also high. The estimation of work days lost to OSH-related causes represents almost 4 percent of global GDP; in some countries, as much as 6 percent (Occupational Safety and Health, ILO 2019).

Improve WSC is essential in high-risk work areas such as the construction industries (Sneller et al, 2018), medical and health care centers (Hill et al, 2015 & Gonzálezformoso et al, 2019), and aviation industries (Lawrenson & Braithwaite, 2018), and its role among office workers is also very essential because of the nature of office work. For example, office workers spend long hours sitting at work, often sitting for hours in front of a computer and in a poor ergonomic position (Lindberg et al, 2018).

Physical injuries and diseases are common among office workers who sit for an extended period and do not move around during their leisure time for exercise. The condition can lead to absenteeism and suffering during work hours, with individuals experiencing fatigue and pain in their body, such as the neck, lower back, shoulder, and knee. In addition, eye and vision problems, stress-related problems, and the working environment can negatively impact the workers' health (Murad et al, 2013).

Prolonging sitting or maintaining a static position for a long time can cause posture problems and vision-related problems from looking into a computer screen for extended periods. In addition, musculoskeletal disorders, unhealthy eating habits, stress problems resulting from overwork, mental health issues caused by job insecurity, and harassment are some of the health effects or defects and accidents that can result from working in an office (Jongin & Jung, 2015 & Eberendu et al, 2018).

"WSC can be viewed as a component of corporate culture, which alludes to individual, job, and organizational characteristics that affect and influence health and safety" (Everon, 2010). "WSC refers to the enduring value, priority, and commitment placed on safety by every individual and every group at every level of the organization" (Hamouda, 2013). WSC is a part of the corporate culture of every organization. "It has been described by the phrase, how we do things around here" (Cooper, 2000).

Health and safety commission (Vu & De Cieri, 2014) defines "WSC as the product of individual and group values, attitudes, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's health and safety management." In its simplest form, it is explained that communications characterize organizations with a good culture of safety based on self-confidence, a shared view of the importance of safety, and trust in the implementation of preventive measures.

Workplace-related disasters, such as accidents, injuries, and illness, resulting from deficiencies in the organization's policies and procedures to address safety. This failure stems from a lack of focus on WSC to make the workplace safe for everyone." For example, a result of the accident investigation in the Chernobyl disaster revealed many irregularities in the organizational "WSC (Cox & Cox, 1991). WSC is precisely planned to minimize the rate of susceptibility to diseases/accidents/injuries, or occupational health problems at the workplace.

As a result of the high prevalence of occupational health problems and high economic burdens caused by poor WSC among office workers in every organization, primary prevention strategies to address the issues are paramount. Therefore, an intervention program could be designed to increase knowledge, improve attitude, and promote good practices related to office ergonomics toward WSC among office workers. Also, every organization needs good practices related to office ergonomics towards WSC among their office workers to create a sense of safety and reduce workers' exposure to occupational injuries, accidents, and diseases. In addition, good practices related to office ergonomics towards WSC are associated with improved productivity among office workers in the workplace (Pourhaji et al, 2016, Sohrabi & Babamiri, 2022, & Bolliger et al, 2022).

#### 1.2 Problem Statement

A recent overview of global working conditions and adverse effects on health and safety presented by the International Labor Organization (ILO) is a new report on Safety and Health at Work (OSH). The report revealed that stress, excessively long working hours, and disease contribute to the deaths of nearly 2.8 million workers every year. At the same time, additional 374 million people get injured or fall ill because of their jobs (Occupational Safety and Health, ILO 2019). Although the report says 36 percent of workers work excessively long hours, meaning more than 48 hours per week, the report highlighted that office workers are particularly more at risk. This is because they tend to do a lot of sedentary work and lack time to exercise, which can cause musculoskeletal and other related occupational health problems among them (Lindberg et al., 2018 & Murad et al., 2013).

The report further revealed that the proportion of work-related deaths – 86 percent –come from disease, with 6,500 people dying daily from occupational diseases, compared to 1,000 from fatal occupational accidents. The most significant causes of mortality are circulatory diseases (31 percent), work-related cancers (26 percent), and respiratory diseases (17 percent).

In Nigeria, Ogun State Hospital, Medical Report Department. (2019) reported occupational-related diseases among office workers in the state, such as stress- related diseases, musculoskeletal disorders, trauma, respiratory/allergic disorders, and eye/vision-related disorders. The report shows that the number of reported occupational diseases increased by 20.2% in 2016, 27.7 % in 2017, 22.8 % in 2018, and finally increased to 29.3% in 2019 in the state.

It is also reported by the Nigeria Social Insurance Trust Fund (NSITF) that the number of deaths and occupation and work-related illness/injury reported to the Federal Ministry of Labor and Productivity has shown that out of 3461 reported accidents/injuries, 238 were fatal in Nigeria. However, in the year 2016 (January to September), which is nine months report for that year, the deaths recorded by (NSITF) was 38.2% compared to the years 2014 and 2015. The cases were low prior to the year 2016 (Nigeria Country Profile on Occupational Safety and Health, ILO 2016). However, a study conducted by Umeokafor et al., 2014 showed that the lack of a culture of safety and inconsistency in Nigeria's health and safety laws are the major factors that contributed to increasing cases of occupational diseases and fatalities in the country (Umeokafor et al., 2014, Diugwu et al., 2012 & Mallon et al., 2015).

Poor WSC can cause significant financial loss to employees and the government. In addition, the economic burden and cost of occupational health problems (diseases and

accidents) arealso high. The estimated workdays lost to OSH-related causes represent almost 4 percent of global GDP; in some countries, as much as 6 percent (UN labor agency report, 2019).

In Nigeria, office workers from public and private sectors also face similar increasing occupational health problems to other countries. They work long hours, starting each day's job early in the morning and sometimes closing as late as midnight, working from 12 -15 hours per week and more, which may extend to weekends. The nature of the office work and the working environment can negatively impact the workers' health (Eberendu et al., 2018 & Lee & Koo, 2015). For example, in Nigeria, Ogun State Hospital, Medical Report Department. (2019), a complementary body reported occupational health problems among office workers in the state, stress-related diseases, occupational musculoskeletal disorders, occupational trauma, respiratory/allergic disorders, and occupational eye/vision-related disorders that increased drastically from 2016 to 2019. Therefore a worksite intervention via health education would be a more feasible option in the short term to increase knowledge, attitudes, and practices regarding occupational safety among office workers in Nigeria. However, there are no local guidelines on work safety health education modules available in Nigeria. Moreover, despite the availability of similar educational interventions overseas, the effectiveness of the respective interventions has not been established in the local setting. Overall, there is a lack of research to address the development, implementation, and evaluation of occupational safety intervention programs to improve office workers' work safety culture in Nigeria.

Based on the estimates of work-related illnesses and accidents/injuries as well as workplace deaths from the above statistics, further studies regarding occupational safety among office workers still need to be done to better understand the workplace safety culture. Furthermore, having a good safety culture in any organization is one of the important factors needed to ensure that occupational health issues can be reduced in the workplace (Oh & Sol, 2008; Smith & Wadsworth, 2009).

### 1.3 Significance of the study

This study could provide additional information on health education, knowledge, and attitude toward work safety culture among government administrative workers in Abeokuta, Ogun State, Southwestern Nigeria. A report from the Ogun Health Directorate shows no known study conducted on knowledge, attitudes, and practices in relation to safety culture at work among government administrative employees in the state.

The findings and recommendations of this study could inform policymakers at the district, regional and national levels in making policies as far as work safety culture are concerned relating to the prevention and control of accidents and occupational diseases among workers in the state.

The study's findings and recommendations could also guide the Ogun Health Directorate to plan and implement effective health education and promote a work safety culture among government administrative workers (office workers) to help create awareness and

its practice and use in the region.

This research introduced the Work Safety Culture Questionnaire (WSCQ) using the IMB model among government office workers as the first official validation of the WSCQ and confirmed high reliability and validity for the assessment of knowledge, attitudes, and practices (KAP) about workplace safety culture (WSC) among the study population. However, the WSCQ can be modified, validated, and used in other populations, especially in high-risk working environments such as construction, medical and health care centers, and aviation.

The limitations identified during the research process provided an opportunity to enhance this intervention for any similar study conducted in the near future. Thefactors associated with work safety culture among government administrative workers were identified. Hence it can raise awareness among government workers. They need to have adequate knowledge, a positive attitude, and good practices toward work safetyculture, eventually minimizing occupational diseases, accidents, or any hazards arising from the work environment and increasing their productivity.

### 1.4 Research Questions

- 1. What are the respondents' baseline knowledge, attitude, and practices related to office ergonomics toward work safety culture?
- 2. What effects of the intervention on the administrative workers' level of knowledge related to office ergonomics of work safety culture between and within groups?
- 3. What are the effects of the intervention on the administrative workers' level of attitudes related to office ergonomics toward work safety culture between and within groups?
- 4. What are the effects of the intervention on the administrative workers' level of practices related to office ergonomics toward work safety culture between and within groups?

### 1.5 Objectives

### 1.5.1 General Objective

The overall objective is to develop, implement and evaluate the effectiveness of interventions of the Work Safety Culture Health Education Module (WSCHEM), using the IMB Model on the knowledge, attitudes, and practices in improving office related ergonomics among the administrative workers (office workers) in Abeokuta, Southwestern Nigeria.

### 1.5.2 Specific objectives

- 1. To describe and compare the status of knowledge, attitude, and practices related to office ergonomics towards WSC of the respondents in the intervention group and waitlist group at baseline.
- 2. To describe and compare the socio-demographic and occupational/office related ergonomic characteristics of the respondents in the intervention group and the waitlist group at baseline.
- 3. To develop and implement a workplace safety culture health education module (WSCHEM) to improve the respondents' knowledge, attitude, and practices related to office ergonomics towards WSC.
- 4. To evaluate the effectiveness of WSCHEM on the respondents' level of knowledge related to office ergonomics on WSC between and within groupsfrom baseline, at one month and three months after the intervention.
- 5. To evaluate the effectiveness of WSCHEM on the respondents' level of attitude related to office ergonomics towards WSC between and within groups from baseline, at one month and three months after the intervention.
- 6. To evaluate the effectiveness of WSCHEM on the respondents' level of practices related to office ergonomics towards WSC between and within groups from baseline, at one month and three months after the intervention.

### 1.6 Research Hypotheses

- 1 Alternative hypothesis (H1): There are significant differences in the respondents' knowledge related to office ergonomics of WSC between and within groups after intervention.
- 2 Alternative hypothesis (H2): There are significant differences in the respondents' attitudes related to office ergonomics towards WSC between and within groups after intervention.
- 3 Alternative hypothesis (H3): There are significant differences in the respondents' practices related to office ergonomics towards WSC between and within groups after intervention.

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