SYSTEMATIC REVIEW

Systematic Review of Intervention Programs to Improve the Level of Knowledge, Attitude, and Practices towards Work Safety Culture among Office Workers

Josiah Oluwaseun Odu[1], Titi Rahmawati Hamedon[1], Aidalina Mahmud[2], Mohd Rafee Baharudin[2]

[1] Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, UPM Serdang Darul Ehsan, Malaysia
[2] Occupational Safety and Health Management Office, Universiti Putra Malaysia, UPM Serdang Darul Ehsan, Malaysia

ABSTRACT

Introduction: Workplace safety culture (WSC) is crucial in providing a safe working environment. Workers need to be reminded regularly of its importance, and therefore effectively, work safety intervention programs need to be identified to be used for this purpose. The main objective is to identify workplace intervention programs to improve WSC among office workers. The specific goals are to determine the types of intervention (knowledge-based, attitudinal, and practices-based interventions), the theories used, and the effectiveness. **Methods:** Databases such as ProQuest, CINAHL, Medline, and ScienceDirect were used to perform literature searches with the keywords ["safety culture training" OR "safety culture education" OR "safety culture promotion"] AND ["office workers" OR "civil servant" OR "white-collar workers" OR "administrative officers" OR "clerical officer"]. The inclusion criteria set for the search process included research articles, publication between January 1, 2015, and September 10, 2020, which were research articles within five years and eight months of publication to the time of data extraction of this study. Availability of full-text articles, articles published in English, and only articles among office workers. **Results:** This review includes seven articles and the techniques used for these studies were knowledge, attitude, and practices towards WSC. **Conclusion:** As the number and scope of intervention of studies on WSC seem scarce, the nature of jobs nowadays and in the future seems to be more office-based; consequently, more of these studies are recommended among office workers.
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Keywords: Office workers, Workplace Safety Culture, Health Education, Knowledge, Attitude, and Practices towards WSC

Corresponding Author:
Titi Rahmawati Hamedon , PhD
Email: rahmawati@upm.edu.my
Tel: +603-97692405

INTRODUCTION

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 towards WSC among office workers (1). 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 (2).

Intervention programs that showed improvement in knowledge, attitude, and practices 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 towards WSC is directly associated with the level of office workers' exposure to occupational health problems at the workplace (1,3,4). Therefore, knowledge, attitude, and practices 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 (1,3,4). 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 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 workdays lost to OSH-related causes represents almost 4 percent of global GDP, in some countries, as much as 6 percent (5).

Improve WSC is essential in high-risk work areas such as the construction industries (6), medical and health care centers (7 & 8), and aviation industries (9), 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 (10).

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 (11).

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 (12,13).

"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" (14 p. 18). "WSC refers to the enduring value, priority, and commitment placed on safety by every individual and every group at every level of the organization" (15 p. 18). WSC is a part of the corporate culture of every organization. "It has been described by the phrase, how we do things around here" (16 p. 115).

Health and safety commission (17 p. 21) 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, result 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" (18 p. 190). 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 towards WSC among the office workers. Also, every organization needs good practices 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 towards WSC are associated with improved productivity among office workers in the workplace (1,4,19).

This review's main objective is to identify workplace intervention programs to improve WSC among office workers. The specific goals are to determine the types of intervention (knowledge-based, attitudinal, and practices-based interventions), the theories used, and the effectiveness.

METHODS

Eligibility Criteria

This study only includes intervention programs on occupational safety among office workers. The inclusion criteria set for the search process included research articles, publication between January 1, 2015, and September 10, 2020, which were research articles within five years and eight months of publication to the time of data extraction of this study. Availability of full-text articles, articles published in English, and only articles among office workers. The primary outcome measure for evaluating the intervention was practices toward WSC. The interventions can adopt any scientific research design with a control group and pre/post research design.

Search Method

This review applied the standard for preferred reporting items for systematic reviews and meta-analyses (PRISMA)

and a systematic literature search using four databases: ProQuest, CINAHL, Medline, and ScienceDirect, and the keywords used to identify all articles were in two groups. The first group was "safety culture training" OR "safety culture education" OR "safety culture promotion," and the keywords for the second group were "office workers" OR "civil servant" OR "white-collar workers" OR "administrative officers" OR "clerical officer." The total number of research articles obtained was 416, and ultimately only seven (7) studies were included in the review. Figure 1 shows the PRISMA flowchart for the systematic review and how the seven studies were included in the review.

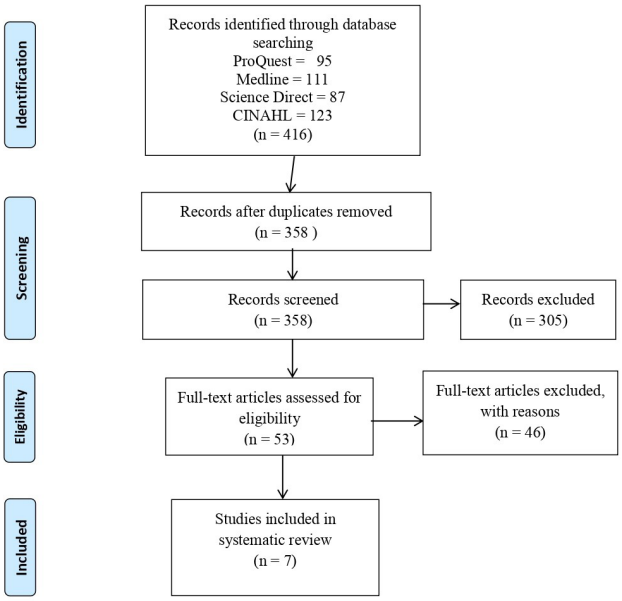

Figure 1: PRISMA flowchart for the systematic review of intervention studies to improve knowledge, attitude, and practices towards WSC among office workers.

Type of Study Participants

All office workers working in administrative, civil service, managerial or clerical settings.

Types of Intervention

a) Scientifically acceptable intervention methods with a control group.
b) Intervention targeted office workers
c) Intervention intended for office, administrative, civil service, or professional-managerial systems
d) office-based intervention.
e) Intervention studies that are randomized control trials, cluster-randomized control trials, and quasi-experimental.

Type of Outcome Measures

a) Practices towards WSC measured as the primary outcome
b) With or without other outcomes such as knowledge, and attitude towards WSC as secondary outcomes

RESULTS

In this review, 416 articles were identified from the database, and only 7 out of 53 full-text articles were assessed for eligibility—the analysis of how the seven studies were included in the review. The total number of research articles obtained was 416, and during the removal of duplicates and abstract screening process, 363 articles were excluded because they did not meet one or more of the inclusion criteria. The remaining 53 articles were reviewed as full text, 46 studies were excluded that did not meet our eligibility criteria, and seven (7) studies were included in the review. The result is summarised in table I using various categories such as author, title, year of publication, location, study design, theory, population, intervention, and outcome.

The first article in this review was the study conducted by (20) in Germany, Denmark, and Austria on practices of work safety intervention to assess the effectiveness of long-term stress management at work. The theory used was the effort-reward imbalance (ERI) model, and the study showed a significant decrease in work stress (OR: 0.04, 95% CI: 0.01-0.06), over-commitment (OR: 0.25, 95% CI: 0.03-0.46) and depressive symptoms (OR: 0.88, 95% CI: 0.46–1.29) after the intervention among the intervention group (MAN-GO) than the control group (SOEP) due to their good practices of WSC.

The second article was the study conducted by (21) in Malaysia, the USA, and Iran on practices of work safety intervention to introduce exercise training intervention to decrease muscle tension and pain in the office setting. The study indicated a significant reduction in the pains of the neck ($F=6.835$, $p=0.013$), shoulder ($F=50.000$, $p<0.001$), and lower back ($F=32.400$, $p<0.001$) after physical training in the intervention group compared to the control group because of their good practices regarding the WSC.

The third article was the research conducted by (22) in Netherland on practices towards work safety intervention to evaluate the multi-component dynamic work intervention to determine its effect on total sitting time at an 8-months follow-up. The study indicated that total sitting time did not differ at eight months of follow-up, and no significant difference ($\beta=-0.27$; 95%CI=-0.60, -0.06, $P>0.05$) was found between the intervention and control groups. The authors attributed this to the relatively low intensity of the intervention.

The fourth article was the study conducted by (23) in Denmark on knowledge towards work safety intervention to examine the effectiveness of occupational health intervention on short-term sickness absence among pre-schools office employees. The intervention was effective in reducing short-term sickness absence because the estimated days of short-term sick leave per person-years

Table I: Summary of the interventional studies to show its effectiveness on the level of knowledge, attitude, and practices towards WSC among office workers

Title/Author/ Year of Publication	Country	Study Design/ Theory	Population	Intervention	Outcome
Long-Term Effectiveness of a Stress Management Intervention(SMI) at Work (20)	Germany & Austria	Randomized controlled trial/ Effort-reward imbalanced (ERI) model	188 male lower or middle manager	Practices toward work safety intervention to assess the effectiveness of long term stress management	The MAN-GO study intervention group show significant improvement in the effort and reward indicator i.e work stress (OR:0.04, 95% CI: 0.01–0.06) after the intervention compared to the SOEP study control group. The intervention group also shows significant improvement in over-commitment (OR:0.25, 95% CI: 0.03–0.46) and depressive symptoms (OR:0.88, 95% CI: 0.46–1.29) compared to the control group
The application of a feasible exercise training program in the office setting (21)	USA, Malaysia & Iran	Randomized controlled trial/ Not mentioned	40 healthy office workers	Practices towards work safety intervention to introduce exercise training program to decrease muscle stiffness and pain in the office setting exercise group i.e (intervention group) compared with the control group	The mixed-design ANOVA indicated that there was significant interaction in the neck (F=6.835, p=0.013) significant interaction in the shoulder (F=50.000, p<0.001), significant interaction in the lower back (F=32.400, p<0.001), reduction in the neck, shoulders and lower back pains of the participants in the exercise group. There was also a significant (P<0.011) decrease in perceived exertion scores after the exercise in the exercise group
Effectiveness of the multi-components dynamic work Intervention to reduce sitting time in office workers (22)	Netherlands	Cluster randomized controlled trial/ Not menti oned	244 office workers	Practices towards work safety intervention to evaluate the dynamic work intervention by determining its effect on total sitting time at 8 months follow-up	The primary outcome, total sitting time at eight months follow-up, no significant difference (β=-0.27; 95%CI=-0.60, -0.06, P>0.05) was found between the control and the intervention group
Effect of a participatory organizational-level occupational health intervention on short-term sickness absence (23)	Denmark	Cluster randomized controlled trial/ Not mentioned	3039 office employees from pre-schools	Knowledge on work safety intervention to examine whether employees in pre-schools that implemented intervention focusing on core tasks at work had a lower incidence of short term sickness absence compared to employees in the control group	The intervention was effective because the estimated short-term sickness days per person-year during the follow-up was 8.68 in the intervention group which is lower compared to 9.17 in the control with an adjusted RR of 0.93 (95%CI 0.86-1.00). The intervention is also effective to reduced risks of long-term sickness absence with a crude RR of 0.83(95%CI 0.69-0.99) & an adjusted RR of 0.84 (95%CI 0.69-1.01).
Workplace-Based Exercise Intervention Improves Work Ability in Office Workers (24)	Australia	Cluster-Randomized controlled trial/ Not mentioned	350 Office workers	Practices towards work safety Intervention to examine the impact of a practices-based exercise (EET) intervention compared to knowledge-based intervention (EHP) among the office workers	EET was effective in increasing work ability post-intervention because of a significant time interaction effect at 12 weeks (OR:1.11, 95% CI: 0.14–2.08) and a near significant at 12 months (OR:1.02, 95% CI: -0.05–2.08) favour the EET group in the per-protocol analysis of the neck cases with ≥70% adherence to the intervention
Is It Possible to Decrease the Burnout Level of Hospital Office Staff by Communication Skill Training Using Therapy Techniques (25)	Turkey	Quasi-Experimental Study Design/ Cognitive Behaviour Therapy	54 Hospital Office Staff	Knowledge of work safety intervention to evaluate the effectiveness of basic communication skill training on burnout level and job satisfaction of hospital office staff	The training was effective in decreasing burnout levels among the participants because the skills-related knowledge of the participants' scores was an average of 13.7±2.2 points for the pre-test and 15.3±1.7 for the post-test. The difference between pre and post scores was significant (p=0.003) Depersonalization scores decreased with p<0.05 and personal accomplishment scores increased with p<0.05 after training
Reducing stress and burnout in the public-sector work environment (26)	Australia	Mixed-Method (Single-Group and Pre/Post Test Design/ Not mentioned	65 government office employees	Knowledge of work safety intervention to evaluate the effectiveness of an 8-weeks meditation-based program to decrease perceived stress and burnout among the office workers	A statistically significant decrease was obtained for perceived stress between pre-test (M=19.83, SD=6.60) and post-test (M=14.54, SD=6.25) and burnout between pre-test (M=17.64, SD=10.49) and post-test (M=13.54, SD=10.38) among the participants after the program

during follow-up was 8.68 in the intervention group, which was lower than 9.17 in the control group with an adjusted RR of 0.93 (95% CI 0.86-1.00). Furthermore, this intervention was also effective in reducing the risk of long-term sickness absenteeism with a crude RR of 0.83 (95% CI 0.69–0.99) and an adjusted RR of 0.84 (95% CI 0.69– 1.01) after the intervention in the intervention group compared to the control group because of their high knowledge about WSC.

The fifth article was the research done by (24) in Australia on practices towards work safety culture to evaluate the effects of a 12-week combined ergonomics and neck/shoulder strengthening exercise intervention (EET) and a 12-weeks combined ergonomics and health promotion intervention (EHP) on work ability among office workers. The intervention was effective in increasing work ability post-intervention because of a significant time interaction effect at 12 weeks (OR:1.11, 95% CI: 0.14–2.08) and a near significant at 12 months (OR:1.02, 95% CI: -0.05–2.08) favour the EET group in the per-protocol analysis of the neck cases among the intervention group participants (EET) compared to the control due to their good practices towards WSC.

The number six article was the study conducted by (25) in Turkey on knowledge towards work safety intervention to evaluate the effectiveness of basic communication skill training on burnout level and job satisfaction of hospital office workers. The theory used was cognitive behaviour therapy (CBT), and the training was effective in decreasing burnout levels among the participants because skills-related knowledge of the participant's scores was an average of 13.7±2.2 points for the pre-test and 15.3±1.7 points for the post-test. Furthermore, the difference between pre and post-scores was significant (p=0.003) due to their high knowledge of WSC after the program.

The last article was the study conducted by (26) in Australia on knowledge towards work safety intervention to assess the efficiency of an 8-weeks meditation-based program to decrease perceived stress and burnout among office workers. A statistically significant decrease was obtained for perceived stress between pre-test (M=19.83, SD=6.60) and post-test (M=14.54, SD=6.25) and burnout between pre-test (M=17.64, SD=10.49) and post-test (M=13.54, SD=10.38) among the participants. The training effectively decreased perceived stress and burnout level due to their high knowledge of WSC after the program.

DISCUSSION

With regard to the intervention program, the different strategies used in this study were knowledge of WSC, attitude towards WSC, and practices towards WSC in the workplace. In this review, knowledge, and attitude towards WSC often refer to educating people about WSC, stress management, reducing burnout at work, and encouraging them through motivation to have a positive attitude towards WSC. However, knowledge, and attitude towards WSC alone have not been effective in achieving meaningful practices towards WSC among office workers (24,27)

In this review, practices towards WSC refer to workplace-based exercise interventions or the implementation of an exercise training program and an intervention program to reduce sitting time among office workers. This strategy had been used as a behavioral change approach for office workers to improve their practices towards WSC, such as work-ability and other outcomes like reducing work stress, neck pain, shoulder pain, and back pain and increasing the range of motion (ROM) of the hips, neck, knees, and shoulders (20,21,22,24). Ideally, the strengths of each intervention program, which played a crucial role in achieving the intended outcome, should be incorporated into the existing intervention program to improve the design and implementation of a similar program in the future.

In this review, one author combined the three strategies, knowledge, attitude, and practices towards WSC. These effectively achieve the desired outcomes at the individual level (24). These combined approaches would first provide participants with the necessary knowledge on WSC through health education before training or exercise to achieve the goals of good practices towards WSC in the workplace. Then, once participants experience an initial improvement in the practices towards WSC in the workplace, this would motivate them to continue improving their practices towards WSC (24). Similar to this finding is a study conducted by (27) on practices towards WSC among office workers in Canada to assess whether completing practical exercises is associated with improved well-being compared with reading information modules. This study showed that office workers who preferred practical exercises over information modules had 2.22 times greater odds of reporting improved well-being from the web-based health intervention (p=.01; 95% CI 1.20-4.11).

The individual session, group, or both were the various means of conducting intervention programs. With the help of information technology (IT), individual meetings with the participants can be held at any time of the day outside the workplace to facilitate their participation. In addition, the video clip recording system that was sent electronically to participants on an electronic device such as one developed by Shariat et al. (21) enabled early communication, real-time feedback, and precise monitoring of participants on duty. However, this IT-based approach resulted in more participants dropping out towards the end of the program due to a lack of face-to-face communication and peer support. On the other hand, personal interaction likely motivated participants to improve their practices toward WSC in order to

Table II: Cross Sectional Critical Appraisal and Risk Assessment using AXIS tool

Appraisal question	Author, year (Yes, No, Do Not Know/Comment)									
	Kim et al (2020)	Barua et al (2020)	Ahmad and Murad (2020)	Moscadelli et al (2020)	Islam et al (2020)	Jolley and Paterson (2020)	Jovančevič and Miličevič (2020)	Ezeibe et al (2020)	Liu and Huang (2020)	Green and Murphy (2020)
Were the aims/objectives of the study clear?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Was the study design appropriate for the stated aim(s)?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Was the sample size justified?	Yes	Yes	Yes	Do not know	Do not know	Yes	No	No	Yes	Yes
Was the target/reference population clearly defined? (Is it clear who the research was about?)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Was the sample frame taken from an appropriate population base so that it closely represented the target/reference population under investigation?	Yes	Yes	Yes	Yes	Yes	Do not know	Do not know	Yes	Yes	Yes
Was the selection process likely to select subjects/participants that were representative of the target/reference population under investigation?	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Were measures undertaken to address and categorise non-responders?	Do not know	Do not know	Yes	Yes	Yes	No	No	No	No	Yes
Were the risk factor and outcome variables measured appropriate to the aims of the study?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were the risk factor and outcome variables measured correctly using instruments/measurements that had been trialled, piloted or published previously?	Yes	Yes	No	Only descriptive statistic involved	Only descriptive statistic involved	Yes	Yes	Yes	Yes	Yes
Is it clear what was used to determined statistical significance and/or precision estimates? (e.g. p values, CIs)	Yes	Yes	No	Only descriptive statistic involved	Only descriptive statistic involved	Yes	Yes	No	Yes	Yes
Were the methods (including statistical methods) sufficiently described to enable them to be repeated?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were the basic data adequately described?	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes
Does the response rate raise concerns about non-response bias?	No	No	No	No	No	Do not know	Do not know	Do not know	No	No
If appropriate, was information about non-responders described?	No	No	No	No	No	No	No	No	No	Yes
Were the results internally consistent?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Do not know	Yes	Yes
Were the results for the analyses described in the methods, presented?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were the authors' discussions and conclusions justified by the results?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were the limitations of the study discussed?	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Were there any funding sources or conflicts of interest that may affect the authors' interpretation of the results?	No	No	No	No	No	No	Do not know	No	No	No
Was ethical approval or consent of participants attained?	Yes	Yes	Do not know	No	No	Yes	Do not know	Yes	Yes	Yes

achieve the desired health outcome (22).

Other intervention programs included only group meetings at the workplace to encourage participants to interact and reflect on their knowledge, attitude, and practices towards WSC (20,23,24,25). In addition, the group activity for engaging office workers was more cost-effective, and this effectively improved their knowledge, attitude, and practices towards WSC after the intervention (20, 23,24,25). However, frequent group meetings in the workplace can disrupt work hours, and such meetings can prevent individuals from openly discussing their problems. Therefore, it more ideal for the participants to hold an individual session for personal feedback and a group session for sharing and peer support (26).

Numerous models or behavioral theories are available as guidelines for developing an intervention program. In this review, two out of seven (28.6%) of the research articles reviewed had utilized an intervention program based on the effort-reward imbalance (ERI) model and cognitive behavioral therapy (CBT), respectively (20,25). The effort-reward imbalance (ERI) based intervention focused on the primary outcomes of practices towards WSC, which were work stress, overwork, and depressive symptoms, while the cognitive-behavioral therapy (CBT) based intervention focused on the secondary outcome of knowledge of WSC, which was burnout level. Although the ERI model and CBT were effective in these studies, the authors pointed out several limitations. Similar to this finding is a study conducted by (28) in Iran on the effectiveness of a model-based health education intervention to improve the ergonomic posture of office computer workers. The finding of this review is consistent with this study (28) that explored the efficiency of theory-based interventions in improving knowledge, attitude, and practices towards WSC regarding ergonomic posture in-office computer workers.

The intervention that based on physical exercise programs among participants (21 & 24), although they did not use any theory to support their studies. However, the studies showed that physical exercise programs effectively increased work-ability after the intervention, reduced neck, shoulder, and lumbar pain in the participants, and improved office workers' range of motion (ROM) or flexibility. In addition, two other studies that did not specify the utilization of behavioral theory in the planning and application of the intervention had shown positive results in enhancing participants' practices towards WSC (23 & 26).

Renaud et al. (22) conducted a study on practices towards work safety intervention to evaluate the multi-component dynamic work intervention to determine its effect on total sitting time at an 8-months follow-up. Unfortunately, the study showed little to no effect in reducing sitting time among the participants. However, Renaud et al. (22) recommended that future research should focus more on high-intensity intervention to reduce sitting time among office workers.

Maintaining long-term health behaviors is a common challenge in any health intervention program. Therefore, a more extended observation period with more time points for the individual assessment would provide a more precise evaluation and exact accuracy of the program's effectiveness (26). In addition, the generalizability of the results in a few studies could be questionable due to the small size of the recruited sample or the limited locations of the studies (21, 25 & 26). Two studies were performed with a single-arm without a control group for comparison, which compromised their internal validity (25 & 26).

CONCLUSION

This review summarized the evidence or findings from various intervention programs conducted abroad to enhance practices towards WSC in the workplace or its sub-components among office workers. All programs carried out have shown promising results despite using different methods. However, this current systematic review revealed difficulty in proving the effectiveness of such programs given the inconsistencies in showing a direct association between knowledge, attitude, and practices towards WSC and occupational health problems among the office workers. Additionally, intervention programs on practices towards WSC to effectively reduce sitting time should focus more on high-intensity intervention to reduce sitting time among office workers.

It is recommended that future intervention programs that will effectively link work safety culture and occupational health problems outcomes are suggested among office workers. The knowledge obtained from this review can be used to design comprehensive work safety culture intervention programs, which can help strengthen the existing occupational health systems and disseminate proper knowledge to wider communities.

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