Workplace Health Promotion: a path to follow

Abstract  It is necessary to transcend barriers with respect to the conceptual development and implementation of Workplace Health Promotion (WHP), given that workplaces are priority settings for health promotion. This study consists of a qualitative analysis that adopts a hermeneutic approach using a state-of-the-art technique. A total of 131 documents consisting of guidelines produced by national and international organizations and articles contained in the Embase, ScienceDirect, and Scielo databases were analyzed. Three main categories emerged from this analysis: conceptual development, study methodologies, and measurement of the results and impacts of WHP. Research output was concentrated mainly in North America, Europe, and Brazil. The studies document the positive impacts of WHP interventions on health, productivity and costs. The reach of WHP interventions is restricted to the formal sector. The working environments of informal workers are minimally addressed. WHP interventions should be geared towards improving work organization, working conditions, active participation and worker personal development; however, research has tended to focus on specific actions that address risk reduction, disease prevention, and workers' habits.

Key words  Health promotion, Workplace, Occupational health
Introduction

Given the adverse social and health conditions that afflict a large portion of the global workforce, it is increasingly necessary to carry out studies that identify and describe workplace health promotion interventions. Workplaces are priority settings for health promotion. The Pan American Health Organization (PAHO) defines workplace health promotion as “a variety of policies and activities in the workplace designed to help employees and workers at all levels to increase control over and improve their health, favoring business productivity and competitiveness and contributing to the economic and social development of countries”1. Various international organizations and academic authorities have defended workplace health promotion (hereafter WHP), based on the premise that a healthy work environment fosters workers health and enhances productivity and general quality of life. There are a number of examples of programs centered on self-care designed to address the main risk factors associated with increased worldwide mortality and morbidity. The World Health Organization (WHO) points out that worldwide prevalence of obesity has more than doubled between 1980 and 20142, and that cardiovascular disease accounts for the majority of deaths from noncommunicable diseases (17.5 million each year), followed by cancer (8.2 million), respiratory diseases (4 million), and diabetes (1.5 million)3.

The WHO reported that the size of the informal economy in the nonagricultural sector in Latin America has shrunk by 55% since the 1990s. It also points out that occupational health and safety interventions are limited mainly to large formal-sector companies: over 85% of workers in the informal sector, including worldwide agricultural workers and immigrants, did not have occupational health coverage in 20144.

These figures show that there is a clear relationship between health and work: as Betancourt points out, work can generate positive or negative health impacts depending on working conditions5. Hence the importance of the evolution of WHP, whose principal objective is “to contribute towards improving the physical and psychosocial working environment, health status, the capacity to have healthier values and life and working styles, and the general wellbeing of workers, in order to move towards sustainable development with equity and social justice”1.

Method

This study consists of a qualitative analysis that adopts a hermeneutic approach to interpret and understand texts and obtain a critical and objective understanding of their meaning. In this respect, Gadamer points out that one who understands admits that his or her own assumed truth must be put to the test and that this should be part of any act of understanding. He confirms therefore that “understanding always contributes to the perfection of historically effective consciousness”6. As Minayo points out, a fundamental element of the understanding processes is that the specific or particular meaning a word may possess is always a result of the context. Understanding requires one to interpret, establish relations, draw conclusions in all directions, and be exposed to errors and prejudgements7.

It is important to highlight that studies of the relationship between work and health have predominantly taken a quantitative approach underpinned by the positivist research paradigm associated with conventional medicine and the quantification of risk. Understanding the relationship between work and health as an historical social process tantamount to acknowledging the need to promote studies that employ a hermeneutic approach as a tool that enables understanding. Lacaz8 confirms this view when he points out that the epistemological limits of the traditional approach to the relationship between work and health mean that “the possibility of considering and grasping the meaning of other relationships slips away” and that the empiricist and positivist view brought by conventional medicine prevents researchers from “considering and operating on the basis of more complex nexus”.

The state-of-the-art technique was used, defined by Hoyos9 as “documental research that is self-developing and whose aim is to explain the construction of meaning of data bases that underpin a diagnosis and prognosis regarding the documental material submitted to analysis”. The documents analyzed in this study included scientific articles contained in selected data bases, and documents and guidelines on WHP produced by national and international organisms. The literature search considered full-text articles written in English, Spanish and Portuguese and published in indexed journals between 2004 and 2014 using the following descriptors based on the Medical Subject Headings (MeSH) and Health
Sciences Descriptors (Descritores em Ciências da Saúde - DeCs): Spanish - “Promoción de la salud”, “Lugar de trabajo”, “Salud laboral” and “Trabajo”; English - “Health promotion”, “Workplace”, Occupational health”, and “Work”; and Portuguese - “Promoção da saúde” and “Trabalho” (Figure 1).

Results

This search and selection process resulted in 131 documents (41 normative documents and guidelines on WHP, and 90 scientific articles) that constituted the units of analysis of this study. With respect to the databases, a total of 1,425 publications were found after eliminating repeated publications. The titles and abstracts were then read to assess their relevance to the topic of study, resulting in a final total of 90 documents. The majority of the publications were produced in Europe and North America, with eight and 28 papers, respectively, followed by South America, with 13, and Asia and Oceania with 11. With respect to language, 66 of the publications were written in English, 14 in Portuguese, and 10 in Spanish. Fifty-eight of the papers were research-based articles. In South America, Brazil stood out from other countries in terms of research development. Three main categories emerged after repeated, in-depth reading: conceptual development, study methodologies, and measurement of the results and impacts of WHP.

Conceptual development of WHP

The documental analysis showed the emergence and development WHP. In 1974, Lalonde pointed out that the health field involved all health-related aspects – human biology, the environment, life styles, and organization of medical care –, and highlighted the influence of working conditions on public health. In 1986, the First

| OBJECTIVES | METHODOLOGY (PHASES OF THE STATE OF THE ART CONSTRUCTION PROCESS) | SUBPRODUCTS |
|------------|---------------------------------------------------------------------|-------------|
| **SPECIFIC OBJECTIVE 1.** Describe worldwide WHP research output, based on the Embase, Science Direct, and Scielo databases and documents produced by national and international organisms. | Preparatory: Approach to WHP, Methodology, State of the art. | Problematization of the object of study. Methodological framework. |
| | Descriptive: Document review Inductive actions: specific to general. | Log frame matrix of factors and indicators Description of WHP research output. |
| **SPECIFIC OBJECTIVE 2.** Categorize and interpret the relevant WHP-related topics addressed by the documents in an integrated manner. | Interpretative: Beginning of deductive actions Definition of core themes | Results: Emerging WHP categories |
| **GENERAL OBJECTIVE:** Construct a state-of-the-art in WHP based on a review of literature produced by national and international organisms and contained in the Embase, Science Direct and Scielo databases during the period 2004 and 2014. | Overall theoretical construction: Global to specific Understanding the meaning of the core themes Planning relations | Discussion, conclusions, recommendations: the current state-of-the-art in WHP |
| | Extension and publication: Dissemination of results Publication and dissemination | |

Figure 1. Relationship between study objectives, methodology and subproducts.

Source: elaborated by the authors.
International Conference on Health Promotion launched the Ottawa Charter for Health Promotion, which highlighted the essential conditions for health and presented basic health promotion strategies. Various subsequent health promotion conferences emphasized the importance of intersectoral alliances, the role of healthy social and physical environments in health promotion, social determinants approaches to public health, specific measures planning, and the commitment of governments, local communities, civil society, and business.

Following the Sundsvall Conference in 1996, the European Network for Workplace Health Promotion (ENWHP) was created, leading to the Luxembourg Declaration on Workplace Health Promotion in 1997, which defines WHP as: “the combined efforts of employers, employees and society to improve the health and well-being of people at work, combining activities directed at improving work organization and the working environment, promoting active participation, and encouraging personal development”11.

In 1998, the WHO published The Health-promoting Workplace: making it happen12, which considers the workplace as a priority for health promotion in the 21st Century. It recognizes that, despite the benefits, up to the publication of this document, WHP efforts had reached only a limited number of work places and workers around the world. The publication defines WHP as “a variety of policies and activities in the workplace designed to help employees and workers at all levels to increase control over and improve their health”.

In general, both the documents produced by international organisms and scientific articles highlighted principles such as comprehensiveness, participation, and social justice. For example, a study undertaken by Ferreira et al.13 in state schools in Rio de Janeiro observed that workers participated and expressed their health needs, and that the “protagonists of the activities” were actively involved in the process. In the same state, Borges and Azevedo14 conducted a qualitative study with rural workers, who felt a sense of freedom and satisfaction with their work that was associated with self-management, autonomy and political organization, which they saw as key elements of health. On the other hand, a study carried out by Souza Soares et al. in 2011 exploring dockers’ knowledge of occupational health and safety, showed that dockers’ knowledge of services and functions can enhance social coparticipation, which in turn “enables the necessary changes to make the port environment more healthy and less dangerous”15.

With respect to working processes, Silva and Tamminger16 point out that the discussion about the adverse effects of inadequate working conditions on workers’ health often hides the role work plays in health promotion. The authors suggest that this role should be restored and working processes should be the central focus of the analysis of the relationship between health and work instead of the individual, who should be considered an active agent in health promotion interventions rather than a simple object of health care.

The documents, particularly those produced by international organisms, emphasize that disease and risk prevention accounts for only a fraction of the aspects that should be encompassed by comprehensive WHP interventions. The findings show there has been important conceptual developments that have influenced methodology and facilitated the implementation of WHP interventions.

**WHP study methodologies**

According to Minayo17, methodology “is the way of thinking and approaching reality”. This section therefore sets out the path or steps that researchers have followed in the study of WHP highlighted by the units of analysis identified by this study, restricting the analysis to the 58 research-based articles selected from the data bases.

With respect to approach, Gianella18 defines scientific disciplines as “forms of knowledge organization that can be justified using thematic or ontological criteria, as well as historical and also socio-institutional criteria, or a combination of the three”. The present study found that 55% of the studies were focused on the fields of health and safety at work, which was often denominated occupational health or occupational health and safety, while 12 articles (13.3%) addressed public health, and nine papers (10%) focused on nursing. Other fields covered to a lesser extent by the articles included nutrition, psychology, preventive medicine, sports medicine, engineering and management.

The analysis of research paradigms drew on the framework proposed by Minayo17. Forty-six studies (81%) – principally in the United States, Europe, and Brazil – adopted a positivist approach. The remaining 12 studies (19%) – most of which were produced in Brazil, followed by the United Kingdom, United States, Norway, and
Iran – drew on the comprehensive sociology paradigm (Figures 2 and 3).

Ten of the 58 studies focused on health workers (including general service workers and administrative staff). The majority of the studies (55, equivalent to 94.8%) involved workers from the formal sector of the economy, while only three cases (5.2%) addressed the informal sector (two studies with agricultural workers and one with artisans and weavers).

Figure 4 shows the different elements and aspects of WHP addressed by the studies. The findings show that a number of studies fall within disease prevention, particularly cardiovascular risk factors and studies directed at events that lead to health problems. The latter category includes a comprehensive review of literature on explanatory models and WHP related to the prevention of workplace accidents with biological material conducted by Palucci and De Jesús. The findings show that there is a growing body of research focused on work organization and the working environment, principally in Europe and Brazil. For example, Leão and Minayo Gomez pose that mental health is often seen as a purely private matter divorced from work and that it is necessary to consider the different elements of work organization (division of labor, hierarchy, types of management, working day, shifts, rhythm, task intensity, breaks etc.) within occupational health and safety surveillance processes to guarantee a comprehensive analysis of the working process.

There is also a growing interest among researchers regarding organizational aspects and certain studies address modification to the workplace's physical environment (Figure 4).

Finally, with respect to comprehensive WHP, Shain et al. point out that health promotion programs can only be effective is they simultaneously consider the individual and environment, and adopt a comprehensive approach to health. Based on a literature review in North America, Hymel et al. found that programs that include both health promotion and protection have a greater impact on both workers’ health and productivity. Other studies concerning comprehensive WHP include those conducted by Thakur et al., Byrne et al., and Larsson et al. and Buerkert et al. Comprehensive WHP programs

---

**Figure 2.** WHP studies that adopted the positivist paradigm by country of publication.

Source: elaborated by the authors.
consider organizational factors that promote the participation of the various actors involved in the process, while adopting a comprehensive approach to health promotion improves overall program effectiveness. In general, the studies regarding comprehensive WHP encompass all the approaches mentioned above (individual, environment, and organization), as well the principles that have gradually emerged throughout the development of concepts of health promotion and their application to the workplace.

Figure 3. WHP studies that adopted the comprehensive sociology paradigm by country of publication.

Source: elaborated by the authors.

Figure 4. Number of articles according to the different aspects of WHP.

Source: elaborated by the authors.
Measurement of the results and impacts of WHP

Measurement of results is essential for effective decision making. Based on a literature review carried out in 2010, Muñoz et al. found that "quantitative assessments, and even more so qualitative studies regarding the effects on productivity, are scarce". The authors confirm that in Colombia there is the tendency to show the results of WHP using traditional quantitative indicators of occupational accidents and diseases.

A meta-analysis conducted in North America in 2013 of 18 studies that described 21 interventions reported that high quality researches in methodological level showed WHP programs had little impact. Programs were more effective when there was at least one weekly contact, emphasizing the need for intensive WHP programs. The study also showed that the programs developed with young persons were more effective. Renaud et al. found an association between program participation rates and absenteeism.

Other studies measure economic impacts, such as that conducted by Carpintero et al. regarding the cost effectiveness of WHP programs, which found that programs had a statistically significant impact on certain aspects such as medical expenses and led to a reduction in the number of compensation claims for occupational diseases. However, the authors concluded that further research is necessary to assess the impact of programs. Aldana et al. and Cherniack et al. showed that WHP programs can generate financial benefits.

The findings show that a number of methods were used to measure the results of WHP programs according to the specific interests and needs of researchers and using indicators ranging from health status, productivity, and the organizational and economic impacts of programs, to program benefits (Chart 1). However, the use and application of indicators remains limited and the studies show an overall lack of coordination between the different aspects of WHP.

Discussion

The state-of-the-art in WHP provides an important insight into key aspects considered during the process of knowledge production, as well as gaps that in one way or another hamper or prevent the development of WHP actions from a conceptual and practical point of view. It is important to note that this critical interpretation and understanding of the current state of knowledge regarding WHP is limited to the guidelines related to WHP produced by national and international organisms and the scientific articles selected from the databases using the descriptors mentioned above.

With respect to the approach taken by international organisms, the WHO's Healthy Workplaces framework and model examines the relationship between work, workers' physical and mental health, the community, and the health of business and society. This approach is based on an analysis of factors that affect workers' health, safety and wellbeing, and company success, which are under the control of workers and employers, from the point of view of continuous improvements to the Deming cycle. Despite mentioning the need to include informal workers, the proposed methodologies are directed at formal working structures. In the same way, the documents analyzed in this study generally focus on formal working environments. Thus, although alternative approaches have been used in the study of WHP, the positivist approach remains the most widely-used approach in WHP research.

The principle of social justice implies that all workers in their working environments should be benefitted by WHP actions. The report Strategy for Strengthening Workplace Health Promotion in Latin America and the Caribbean, emphasizes the need to target workers with special needs, such as agricultural workers, women, the self-employed, and older adults. However, the present analysis shows that such groups are targeted by a mere four of the 58 studies. The findings corroborate the continued existence of a traditional model that perpetuates social exclusion, given that the majority of the studies of WHP ignore specific issues related to the precariousness of working conditions and vulnerability of workers in the informal sector, despite the fact this group accounts for the majority of the workforce in many countries in Latin America.

It is interesting to note that in Brazil, which accounts for the majority of studies produced in the Latin America and the Caribbean region, the findings of this study show an equal balance in the use of positive and alternative research approaches. According to Robledo and Agudelo, this can be seen as a clear sign that health promotion is gaining importance and a growing tendency to combine positivist and non-positivist research methods. In terms of research, Brazil is
The results of this analysis show that the majority of studies were orientated towards the development of individual skills and responsibilities centered basically on disease prevention. These results are similar to the findings of a study carried out in Scandanavia based on 63 publications, which found that the main focus of the studies was disease prevention, rather than health promotion. Furthermore, the majority of studies showed that interventions did not seek to carry out changes to the working environment; rather the workplace was seen as an appropriate setting for providing guidance to people with respect to change in behavior, lifestyles, and disease prevention. This may be down to the fact that researchers and intervention developers are con-

| Health status and related aspects |
|----------------------------------|
| Global health indicators         |
| Quantitative indicators of occupational accidents and diseases |
| Risk factor profiles for changes in health (e.g.: cardiovascular risk factor profile) |
| Obesity rates                    |
| Signs of stress, depression      |
| Variations in risk of mortality  |
| Prevalence of chronic diseases   |
| Variation in personal habits: reduction in smoking, increased physical activity, changes in intake of fruits and vegetables in the workplace, reduction in the time spent sitting at work, changes in the use of personal protective equipment |
| Health self-assessment           |
| Physiological measurements, biomarkers (e.g.: blood pressure, cholesterol, heart rate variability, salivary cortisol) |
| Personal health skills           |
| Workers’ perceptions regarding their health status and work |

| Productivity and organizational aspects |
|----------------------------------------|
| Productivity at work                   |
| Participation rates                    |
| Overall absenteeism, absenteeism due to illness |
| Work performance                       |
| Work skills                            |
| Compliance (e.g.: training, coaching, intake of fruit and other proposed activities) |
| Fidelity (e.g.: adherence to training and coaching protocols) |
| Work satisfaction                      |
| Work commitment                        |
| Context (individual, social, organizational, and program limits and facilitators) |
| Attitudes towards the workplace        |
| Increased leadership skills            |
| Improvements in other psychosocial and organizational factors |
| Social responsibility indicators       |
| Perceptions regarding changes in the working environment |

| Economic impacts                     |
|--------------------------------------|
| Medical expenses                     |
| Variation if the number of compensation claims for occupational diseases |
| Health care costs                    |
| Savings-investment relationship      |
| Number of days lost                  |
| Return on investment                 |

Source: prepared by the authors.
cerned with directing their research and program efforts towards palpable needs: the global reality of noncommunicable diseases. Given that lack of physical activity, inadequate diets, smoking, and drinking increase the risk of death due to a non-communicable disease, intervention is necessary to ensure that workplaces become settings that are capable of promoting healthy lifestyle behaviors.

Apart from focusing on workers’ skills and responsibilities, it is necessary to take a critical approach to the workplace that involves changes to the work environment and organization of work in accordance with international guidelines. Although certain approaches have pointed in this direction, further efforts are required to advance towards a comprehensive approach. This view is endorsed by Carvalho who, based on a study of approaches to health in Canada, observed that health promotion programs and activities were oriented towards education activities geared towards reducing exposure to risks generated by “inappropriate behavior”. The author points out that, although these approaches have had positive effects on some groups, the overall impact of interventions on the living conditions of the target population was limited due to the emphasis on piecemeal actions geared towards healthy lifestyles.

The analysis showed that researchers used various indicators to assess the health status, productivity, work organization, and economic impacts of programs, and that studies demonstrated the benefits of WHP. However, these results invite a review of the current indicators proposed by the guidelines, which are apparently limited to traditional standardized measures, such as occupational accident and morbidity rates and days lost, based on a health risk and disease reduction perspective. WHP enables the measurement of positive aspects, since the promotion of these aspects is the essence of this strategy.

Conclusions

Stemming from the ideas surrounding health promotion, the concept of WHP has evolved globally over the last four decades. This study strongly emphasizes that disease prevention and actions geared towards specific risk factors make up only a small fraction of the actions envisaged under a comprehensive approach to WHP. It also shows that the evolution of the concept has involved a number of methodological advances that facilitate the implementation of this strategy: however, much more needs to be done to ensure the successful implementation of effective WHP. The prevailing global economic model is an obstacle to the development of policy and the implementation of comprehensive WHP processes.

It is necessary to promote the formulation and implementation of workers’ health policies and interventions that address the specific characteristics of the informal sector, which have up till now been ignored or minimally addressed.

Finally, truly comprehensive, interdisciplinary and intersectoral WHP interventions should be implemented, based on the principles of social justice and sustainability, which goes beyond an approach exclusively focused on risk reduction. WHP programs and activities should also incorporate mechanisms that encourage the participation of workers from all levels underpinned by social policies that benefit workers.
Collaborations

L Chaves-Bazzani drafted the article based on the results of her master’s thesis and participated in all stages of the development of this study. As master’s thesis supervisor, AI Muñoz-Sánchez made significant contributions to study conception, methodology, interpretation of data and the critical revision of this article.

References

1. Organización Panamericana de la Salud. Organización Mundial de la Salud. Estrategia para el fortalecimiento de la promoción de la salud en los lugares de trabajo en América Latina y el Caribe. Anexo 6. Relatoría Taller Estrategia de promoción de la salud en los trabajadores en América Latina y el Caribe [Internet] 2000 [cited 2012 May 8];[23 p.]. Available from: http://www.who.int/occupational_health/regions/en/oehpromocionsalud.pdf

2. Organización Mundial de la Salud. Obesidad y sobrepeso. Nota descriptiva [Internet] 2015 [cited 2016 Jan 15]. Available from: http://www.who.int/mediacentre/factsheets/fs311/es/

3. Organización Mundial de la Salud. Enfermedades no transmisibles. Nota descriptiva [Internet] 2015 [cited 2015 Nov 5]. Available from: http://www.who.int/mediacentre/factsheets/fs355/es/

4. Organización Mundial de la Salud. Protección de la salud de los trabajadores. Nota descriptiva N°389 [Internet] 2014 [cited 2015 Sep 8]. Available from: http://www.who.int/mediacentre/factsheets/fs389/es/

5. Betancourt O. Enfoque alternativo de la salud y seguridad en el trabajo. Quito: FUNSAD. IESS, Prevención es desarrollo; 2007.

6. Gadamer HG. Verdad y método. Colección Hermeneutica. [Internet]. [cited 2015 May 18]. Available from: http://www.olimon.org/uan/gadamer-verdad_y_metodo_ii.pdf

7. Minayo MC. Hermenéutica - dialéctica como camino do pensamento social. In: Fiocruz, editor. Caminhos do pensamento: epistemologia e método. Rio de Janeiro: Fiocruz; 2003. p. 83-107.

8. Lacaz FADC. O campo Saúde do Trabalhador: resgatando conhecimentos e práticas sobre as relações trabalho-saúde. Cad Saude Publica 2007; 23(4):757-766.

9. Hoyos C. Un modelo para la investigación documental: Guía teórico-práctica sobre construcción de Estados del Arte. Medellín: Señal; 2000.

10. Lalonde M. A new perspective on the health of Canadians. A working document. Ottawa: Gobierno de Canadá; 1974.

11. Red Europea de la promoción de la salud en el trabajo. España, Ministerio de empleo y seguridad social. Instituto Nacional de Seguridad e Higiene en el Trabajo. Declaración de Luxemburgo. [Internet] 1997 [cited 2012 May 8]. Available from: http://www.insht.es/PromocionSalud/Contenidos/Promocion%20Salud%20Trabajo/Documentos%20ENWHP/

12. Organización Mundial de la Salud (OMS). The Health-Promoting Workplace: Making it Happen. Genebra: OMS; 1998.

13. Ferreira E, Brito J, Neves MY, Athayde M. A Promocão da Saúde a partir das situações de trabalho: considerações referenciadas em uma experiência com trabalhadores de escolas públicas. Interface (Botucatu) 2009; 13(30):107-119.

14. Borges JC, Azevedo E. Aqui ninguém domina ninguém: sentidos do trabalho e produção de saúde para trabalhadores de assentamento do Movimento dos Trabalhadores Rurais Sem Terra. Cad Saude Publica 2013; 29(8):1595-604.
15. De Souza JF, Cezar-Vaz MR, Sant’Anna CF. Prevenção de agravos e promoção da saúde: um estudo com trabalhadores portuários. *Texto Contexto Enferm* 2011; 20(3):425-434.

16. Silva CO, Tamminger T. O trabalho como operador de saúde. *Cien Saude Colet* 2014; 19(12):4751-4758.

17. Minayo MC. Investigación social. *Teoría, método y creatividad*. Buenos Aires: Lugan; 2003.

18. Gianella A. Las disciplinas científicas y sus relaciones. *Anales de la educación común* 2006; 2(3):74-83.

19. Prior JO, Van Melle G, Crisinel A, Burnand B, Cornuz J, Darioli R. Evaluation of a multicomponent worksite health promotion program for cardiovascular risk factors - Correcting for the regression towards the mean effect. *Prev Med* 2005; 40(3):259-267.

20. Freak-Poli R, Wolfe R, Backholer K, de Courten M, Perers A. Impact of a pedometer-based workplace health program on cardiovascular and diabetes risk profile. *Prev Med* 2011; 53(3):162-171.

21. Cipriano G, Neves LMT, Cipriano GFB, Chiappa GR, Borghi-Silva A. Cardiovascular disease prevention and implications for worksite health promotion programs in Brazil. *Prog Cardiovasc Dis* 2014; 56(5):493-500.

22. Cahalin LP, Myers J, Kaminsky L, Briggs P, Forman DE, Patel MJ, Pinkstaff SO, Arena R. Current Trends in Reducing Cardiovascular Risk Factors in the United States: Focus on Worksite Health and Wellness. *Prog Cardiovasc Dis* 2014; 56(5):476-483.

23. Muto T, Hashimoto M, Haruyama Y, Fukuda H. Evaluation of a workplace health promotion program to improve cardiovascular disease risk factors in sales representatives. *International Congress Series* 2006; 1294:131-134.

24. Cho SW, Kang JY, Park YK, Paek YM, Choi TL. A 12-week worksite health promotion program reduces cardiovascular risk factors in male workers with the apolipoprotein E2 and apolipoprotein E3 genotypes, but not in apolipoprotein E4 genotype. *Nutrition Research* 2009; 29(8):542-550.

25. Palucci MH, De Jesus LC. Modelos explicativos e de intervenção na promoção da saúde do trabalhador. *Acta Paul Enferm* 2008; 21(4):654-659.

26. Bejarano JJ, Díaz M. Alimentación laboral: Una estrategia para la promoción de la salud del trabajador. *Rev fac med unal* 2012; 60(Supl.):87-97.

27. Kornre M, Toukas MA, Frantzseou E, Yang J, Kales S. Mediterranean Diet and Workplace Health Promotion. *Curr Cardiovasc Risk Rep* 2014; 8(12):416.

28. Franco AS, De Castro IRR, Wallkoff DB. Impact of the promotion of fruit and vegetables in their consumption in the workplace. *Rev Saude Publica* 2013; 47(1):29-36.

29. Thorsen AV, Lassen AD, Tetens I, Hels O, Mikkelsen BE. Long-term sustainability of a worksite canteen intervention of serving more fruit and vegetables. *Public Health nutrition* 2010; 13(10):1647-1652.

30. Stoia M, Oancea S. Workplace Health Promotion Program on Using Dietary Antioxidants (Anthocyanins) in Chemical Exposed Workers. *Procedia Engineering* 2012; 42:1989-1996.

31. Nakade M, Muto T, Hashimoto M, Haruyama Y. Internet-based education program of nutrition as a workplace health promotion tool – A review of the literature. *International Congress Series* 2006; 1294:135-138.

32. Stewart-Knox BJ. Eating and stress at work: The need for public health promotion intervention and an opportunity for food product development? *Trends in Food Science & Technology* 2014; 35(1):52-60.

33. Maes L, Van Cauwenberghhe E, Van Lippevelde W, Spitaels H, De Pauw E, Oppert J-M, Van Lenthe FJ, Brug J, De Bourdeaudhuij I. Effectiveness of workplace interventions in Europe promoting healthy eating: a systematic review. *Eur J Public Health* 2011; 21(5):677-682.

34. Pressler A, Knebel U, Esch S, Kolbl D, Esfeld K, Scherr J, Haller B, Schmidt-Trucksass A, Krcmar H, Halle M, Leimeister JM. An internet-delivered exercise intervention for workplace health promotion in overweight sedentary employees: A randomized trial. *Prev Med* 2010; 51(3-4):234-239.

35. Barené S, Krustup P, Holtermann A. Effects of the workplace health promotion activities soccer and zumba on muscle pain, work ability and perceived physical exertion among female hospital employees. *PLoS ONE* 2014; 9(12):e115039.

36. Marshall AL. Challenges and opportunities for promoting physical activity in the workplace. *J Sci Med Sport* 2004; 7(1 Suppl.):69-66.

37. Conn VS, Haf dahl AR, Cooper PS, Brown JM, Lusk SL. Meta-Analysis of Workplace Physical Activity Interventions. *Am J Prev Med* 2009; 37(4):330-339.

38. Robroek SJ, Polinder S, Breidt FJ, Burdorf A. Cost-effectiveness of a long-term internet-delivered worksite health promotion programme on physical activity and nutrition: a cluster randomized controlled trial. *Health Educ Res* 2012; 27(3):399-410.

39. Inauen A, Jenny G, Bauner G. Design principles for data- and change-oriented organisational analysis in workplace health promotion. *Health Promot Int* 2011; 27(2):273-283.

40. Holmqvist M. Corporate social responsibility as corporate social control: The case of work-site health promotion. *Scandinavian Journal of Management* 2009; 25(1):68-72.

41. Leão LHC, Minayo Gomez C. A questão da saúde mental na vigilância em saúde do trabalhador. *Ciencia & Saude Coletiva, 2014; 19(12):4649-4658.

42. Shain M, Kramer D. Health promotion in the workplace: framing the concept; reviewing the evidence. *Occup Environ Med* 2004; 61(7):643-648.

43. Hyml PA, Loeppeke RR, Baase CM, Burton WN, Har tenbaum NP, Hudson TW, McLellan RK, Mueller KL, Roberts MA, Yarborough CM, Konicki DL, Larson PW. Workplace health protection and promotion: A new pathway for a healthier-and safer-workforce. *J Occup Environ Med* 2011; 53(6):695-702.

44. Thakur J, Bains P, Kar S, Wadhwa S, Moorjthn P, Kumar R, Wadwalkre S, Sharma Y. Integrated healthy workplace model: An experience from North Indian industry. *Indian J Occup Environ Med* 2012; 16(3):108-113.
45. Byrne DW, Goetzel RZ, McGown PW, Holmes MC, Beckowski MS, Tabrizi MJ, Kowlessar N, Yarbrough MI. Seven-year trends in employee health habits from a comprehensive workplace health promotion program at Vanderbilt University. *J Occup Environ Med* 2011; 53(12):1372-1381.

46. Larsson R, Ljungblad C, Sandmark H, Akerlind I. Workplace health promotion and employee health in Swedish municipal social care organizations. *J Public Health* 2014; 22(3):235-244.

47. Buerkert N, Mucken J, Großschadl F, Sprenger M, Rohrauer-Näf G, Ropin K, Martinek E, Dorner T. Good practice models for public workplace health promotion projects in Austria: promoting mental health. *Wien Med Wochenschr* 2014; 164:141-145.

48. Muñoz AI, Castro E. De la promoción de la salud a los ambientes de trabajo saludables *Salud trab* 2010; 18(2):141-152.

49. Rongen A, Robroek S JW, van Lenthe FJ, Burdorf A. Workplace Health Promotion: A Meta-Analysis of Effectiveness. *Am J Prev Med* 2013; 44(4):406-415.

50. Renaud L, Kishchuk N, Juneau M, Nigam A, Tetreault K, Leblanc MC. Implementation and outcomes of a comprehensive worksite health promotion program. *Can J Public Health* 2008; 99(1):73-77.

51. Carpintero P, Lago S, Neira A, Terol I. ¿Es coste-efectivo el desarrollo de programas de promoción de la salud en los lugares de trabajo? *Med segur trab* 2014; 60(236):566-586.

52. Aldana SG, Merrill RM, Price K, Hardy A, Hager R. Financial impact of a comprehensive multisite workplace health promotion program. *Prev Med* 2005; 40(2):131-137.

53. Cherniack M, Lahiri S. Barriers to implementation of workplace health interventions: an economic perspective. *J Occup Environ Med* 2010; 52(9):934-942.

54. Organización Mundial de la Salud. Entornos laborales saludables: Fundamentos y modelo de la OMS. Contextualización, prácticas y literatura de apoyo. 2010 [cited 2012 sept 17]; [137 p.]. Available from: http://www.who.int/occupational_health/evelyn_hwp_spanish.pdf

55. Robledo R, Agudelo C. Aproximación a la construcción teórica de la promoción de la salud. *Rev salud pública* 2011; 13(6):1031-1050.

56. Torp S, Vinje HF. Is workplace health promotion research in Nordic Countries really on the right track? *Scand J Public Health* 2014; 42(15):74-81.

57. Carvalho SR. Promoción de la salud,”empowerment” y educación: una reflexión crítica como contribución a la reforma sanitaria. *Salud Colectiva* 2008; 4(3):335-347.