



A bibliometric review on Workplace Health and Wellness Programs: Main research perspectives

Un análisis bibliométrico sobre los Programas de Salud y Bienestar Laboral: principales perspectivas de investigación


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Abstract

The implementation of Workplace Health and Wellness Programs aims to improve the health and wellness conditions of employees, reduce absenteeism and in turn positively impact productivity in organizations; however, there has been no evidence of a bibliometric analysis that has allowed identifying research trends by the academic community applying the Tree of Science (ToS) methodology. To cover this aspect, articles published from 2001 to 2020 in the Web of Science database were reviewed, building the ToS of Workplace Health and Wellness Programs, identifying and analyzing the three main research perspectives: health promotion and prevention, mental stress intervention and burnout prevention, and prevention of the effects of obesity through physical activity. Taking into account that the literature identified in this review has been generated mostly in the United States and the United Kingdom, it is recommended that future research be conducted in our country to serve as an academic reference for Colombian organizations to strengthen the management of the health and well-being of their human talent.

Keywords: Bibliometric analysis; science tree; health conditions; physical health; mental health; occupational safety and health

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Resumen

La implementación de Programas de Salud y Bienestar Laboral tiene como propósito mejorar las condiciones de salud y bienestar de los empleados, reducir el absentismo y a su vez impactar positivamente la productividad en las organizaciones; sin embargo, no se ha evidenciado un análisis bibliométrico que haya permitido identificar y analizar las perspectivas de investigación de los Programas de Salud y Bienestar Laboral por parte de la comunidad académica aplicando la metodología del Árbol de la Ciencia (ToS). Para cubrir este aspecto se revisaron los artículos publicados desde el año 2001 hasta el 2020 en la base de datos Web of Science, construyendo el ToS de los programas de Salud y Bienestar Laboral, identificando y analizando las tres principales perspectivas de investigación: la promoción y prevención en salud, la intervención del estrés mental y la prevención del burnout, y la prevención de los efectos de la obesidad a través de la actividad física. Teniendo en cuenta que la literatura identificada en la presente revisión se ha generado en mayor proporción en Estados Unidos y Reino Unido, se recomienda la realización de futuras investigaciones en nuestro país que sirvan de referencia académica para que las organizaciones colombianas fortalezcan la gestión de la salud y el bienestar laboral de su talento humano.

Palabras clave: Análisis bibliométrico; árbol de la ciencia; condiciones de salud; salud física; salud mental; seguridad y salud en el trabajo

INTRODUCTION

In Colombia, the 56.4% of the population is overweight and obese, and only half of Colombian adults follow the recommendations of 150 minutes per week of moderate physical activity or 75 minutes per week of vigorous activity (Ministry of Health and Social Protection-Minsalud, Instituto Colombiano de Bienestar Familiar-ICBF, Instituto Nacional de Salud-INS, Departamento Administrativo para la Prosperidad Social-DPS, 2015; Organización Panamericana de la Salud-OPS, 2012). In relation to mental health, the National Mental Health Survey conducted by Minsalud, la Pontificia Universidad Javeriana y Datos, Procesos y Tecnología SAS (2015), reports that 10 out of every 100 adults between 18 and 44 years old and 12 out of every 100 adolescents have some problem which suggests the presence of a mental illness.

Likewise, Minsalud (s.f.) indicates that, out of a population of approximately 10.5 million affiliated workers, during 2020 there were 478 deaths of occupational origin, 50 947 occupational diseases were classified. In the same way, 450 805 occupational accidents occurred, which represents a rate of 4.31 accidents per 100 workers.

The main diseases classified as occupationally-caused according to the National Survey of Occupational Safety and Health Conditions in the General System of Professional Risks (Minsalud, 2013) are in their order: musculoskeletal injuries, auditory pathologies, respiratory system diseases, and mental and behavioral disorders.

When reviewing in the literature definitions of well-being at work, it is found as: the absence of negative feelings and conditions is the result from adaptation to the work environment and implies a subjective evaluation through satisfaction and affection (Keyes, 1998). It has also been defined as the physical and mental health of the employee at work (Currie, 2001), and as a notion that implies a sense of happiness, and a physical and mental “well-being” (Baptiste, 2008).

Other authors define it in terms of people’s satisfaction with their jobs, in terms of pay, colleagues, supervisors, working conditions, safety, training opportunities, among others Warr (2002) and Vanhala and Tuomi (2006), delimit it to the psychological well-being of employees: affective well-being, job satisfaction, aspirations, anxiety and burnout.

Wellness is more than just avoiding getting physically ill; it represents a broader biopsychosocial construct that includes physical, mental and social health. Employees who are physically and mentally healthy, are willing to contribute to their workplace (Chartered Institute of Personnel and Development-CIPD, 2007). In alignment with this view, Kanjere, Thaba and Makgato (2014), conceive it as a three-dimensional concept: (a) physical health of employees, (b) mental illness and (c) social dimensions.

According to Wipfli et al. (2018), globally, only 29% of companies have implemented workplace wellness programs. Based on data from The Global Wellness Survey 2010, 49% of companies that implemented wellness programs reported lower health care

costs, and in the United States, employees who participate in wellness initiatives are more likely to smoke less, exercise more, and better manage their weight. In addition, participation over time leads to reduced health care costs, absenteeism, as well as higher productivity (Buck Consultants, 2010).

The purpose of the Workplace Health and Wellness Programs (WHWP) is to improve the physical and mental health conditions of employees, preventing the occurrence of diseases and their negative effects. Likewise, they aim to improve productivity and generate financial returns for companies. For Clack and Fraser (2019), when conducting an evaluation of the impact of health and wellness programs, they concluded that these can be effective tools to influence the health of a population.

In order to evaluate the impact of a program, Mills, Kessler, Cooper and Sullivan (2007), Sapag and Kawachi (2007), Carpintero, Lago, Neyra and Terol (2014), Malpartida and Angles (2018), among the most outstanding results are the decrease in the level of monthly absenteeism and the increase in the level of performance. Approaches that are ratified by Cerqueira, León and De la Torre (2007), García, Silva, Huerta and Chiu (2017) and Valencia, Hincapié, Gómez and Molano (2019), indicate that when a good health promotion program is designed at work, this results in an increase in health and productivity at work.

Similarly, Goetzel and Ozminkowski (2008) indicate that the goal should be to propose an increase in such programs, an approach that coincides with the conclusions presented by Linnan et al. (2008), who state that the number, quality and types of programs should be increased, especially in smaller companies, where they are least implemented.

Zimolong and Elke (2009) argue that, although the management of physical and mental health requires a high degree of personal responsibility, supports within the workplace are essential in organizational productivity. In turn, Kanjere et al. (2014) posit that introducing a wellness program in an organization creates awareness, facilitates personal change, health management and promotion.

The CIPD (2016) states that the purpose of wellness programs is not simply about managing a physical and cultural environment so as not to cause harm to employees, it requires organizations to actively help their employees maximize their physical and mental health.

Now, Äikäs, Absetz, Hirvensalo and Pronk (2019) in a recent study conclude that participation in the programs should be further promoted, ratifying the benefits with lifestyle changes and improvements in health. In the same vein, Das et al. (2020) stress the urgent need for such programs to be designed to improve employee well-being, even more so in modern times.

Finally, in the context of the pandemic caused by COVID-19, according to research conducted in the United Kingdom among 650 health care experts (CIPD, 2021), it was identified that in addition to ensuring that workplaces are safe for COVID, organizations must develop a strategic and holistic approach to the health, safety and well-being of their employees focused on prevention.

Although the aforementioned topic is highly relevant for organizations, their employees, academia and the government sector, there is a lack of a bibliometric analysis applying the (Tree of Science- ToS) methodology, which allows identifying and analyzing the research perspectives regarding WHWP by the academic community.

To fill this knowledge gap, this review is presented methodologically in three stages: first, a statistical analysis of the scientific production available from the Web of Science -WoS and Scopus databases is performed; second, using only the information extracted from WoS as a reference, the tree of science is constructed by applying the ToS algorithm; and third, the research perspectives of WHWP are identified and analyzed through an analysis of co-citations of the articles exported from WoS. Finally, this article establishes conclusions, limitations and respective recommendations for future research in this area of knowledge.

METHODOLOGY

Moment 1:

Bibliometric analysis of the importance of WHWP

The bibliometric analysis to determine the importance of WHWP was performed taking as reference the articles exported from the WOS and Scopus databases during the period 2001-2020, according to the following search criteria:

- *Search equation:* “workplace wellness program” OR “workplace health promotion program”.
- *Search period:* from January 01, 2001 to April 12, 2020.
- *Criteria:* documents involving this criterion in their title, subject, abstract, and keywords. No filters were applied to the results.
- *Results:* 499 articles in Web of Science and 651 articles in Scopus. Resultados: 499 artículos en Web of Science y 651 artículos en Scopus.

To determine the importance of the review topic, three metrics were used: annual scientific production, journal relevance and visibility of the main authors. It is clarified that the information obtained from the Scopus database was used only for the purpose of making bibliometric comparisons at this early stage.

Moment 2:

WHWP Science Tree

Taking into account only the articles extracted from WoS, given that, at the time of applying the ToS algorithm, it still had usage restrictions with respect to the information exported from the Scopus database. We proceeded to import the seed (file in txt format extracted from Web of Science) and to run the Tree of Science

(ToS) algorithm code in the RStudio Cloud platform obtaining the main results of root, trunk and leaves, applying the methodology proposed by [Robledo, Osorio and López \(2013\)](#) and [Robledo-Giraldo, Duque-Méndez and Zuluaga \(2014\)](#) which allows categorizing or classifying papers and research according to their relevance, intermediation and evolution over time.

This tree is made up of the root (classic articles), the trunk (structural articles) and the leaves (recent articles). This methodology has been applied in bibliometric analyses in research in various fields of knowledge such as those of [Zuluaga et al. \(2016\)](#), [Buitrago, Duque and Robledo \(2019\)](#), [Landínez, Robledo and Montoya \(2019\)](#), [García, Echeverry and Vieira \(2020\)](#), [Pineda, Agudelo, Rojas and Duque \(2021\)](#), [Barrera, Robledo and Zarela \(2021\)](#) and [Ramos-Enríquez, Duque and Viera \(2021\)](#).

Taking the tree analogy as a reference, according to [Perrson \(1994\)](#), it is identified that the articles located at the root are the most cited and are considered hegemonic-classic in the field of knowledge. According to [Shafique \(2013\)](#) and [Ramos-Enríquez et al. \(2021\)](#), in the trunk are located the intermediary articles that favor the structuring of the tree, show the behavior of their interrelationships by citing the root articles, and being cited by the leaf articles. Finally, the leaves, according to [Robledo et al. \(2014\)](#) are conformed by the most recent articles, these cite the root and trunk papers, but are not so frequently cited.

Moment 3:

WHWP research perspectives: a co-citations analysis

From the bibliographic references of all the exported articles, according to [Jacomy, Venturini, Heymann and Bastian \(2014\)](#), a network was constructed in the Gephi visualization software, which, taking as a reference what was proposed by [Blondel, Guillaume, Lambiotte and Lefebvre \(2008\)](#), applies a clustering algorithm to identify the network of co-citations, thus obtaining the three main perspectives of the research topic. Then, in the same way as [Ramos-Enríquez et al. \(2021\)](#), the aspects that make up each perspective were determined and analyzed using text mining and generating the word clouds through the RStudio Cloud package, using the Wordcloud algorithm ([Ohri, 2012](#)). Finally, the most relevant documents from each perspective were analyzed using their level of co-citations as a selection criterion.

RESULTS

Bibliometric analysis of the importance of WHWP

To identify the importance of the research topic for the academic community, the publications on Health and Workplace Wellness Programs during the period 2001-2020 were reviewed. [Figure 1](#) shows a growing trend of bibliographic production

in the WoS and Scopus databases, which is evidence of the increased interest in the research topic in recent years. Likewise, a greater number of publications were identified in Scopus than in WoS until 2016, after which a similar level of articles published in both databases was observed.

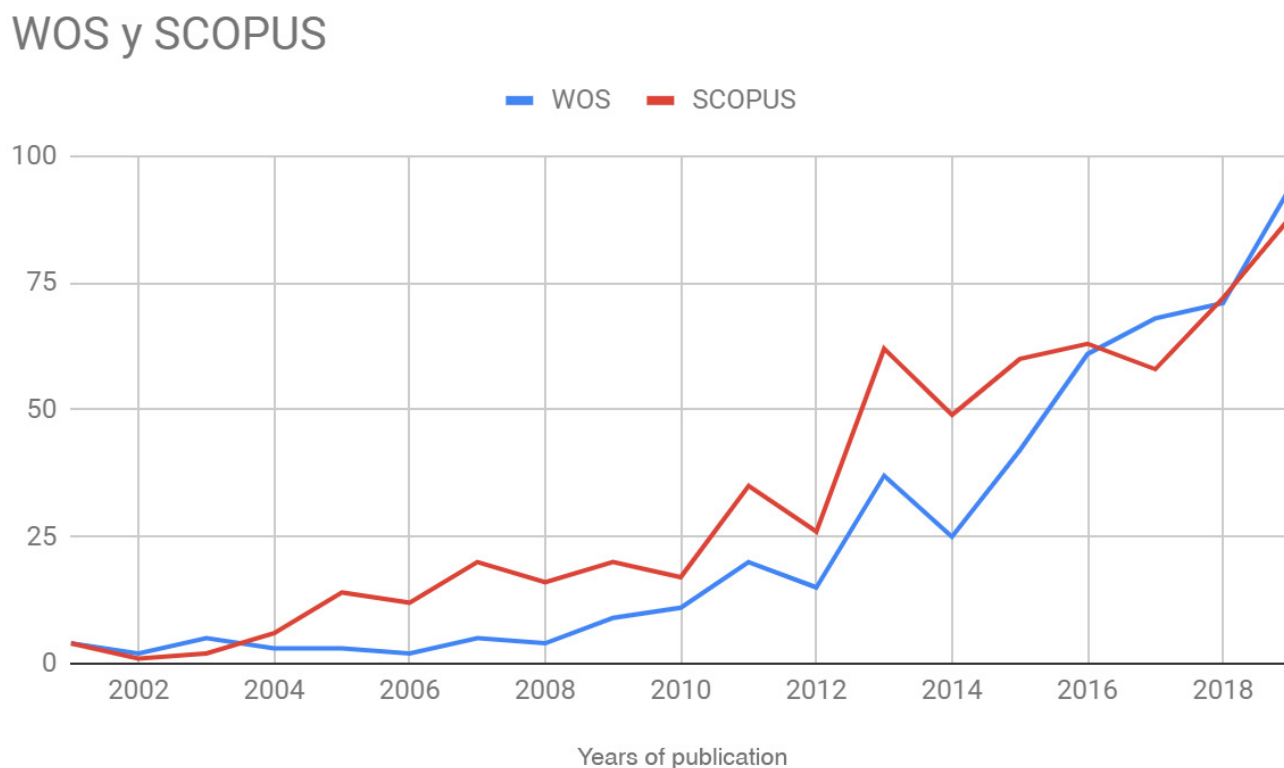


Figure 1. Scientific production of Workplace Wellness and Health Programs, period 2001-2020.
Source: Own elaboration.

According to the results obtained from the WoS and Scopus bibliographic databases, **Table 1** identifies the ten researchers with the highest number of publications related to Workplace Wellness and Health Programs. To evaluate the relationship between the number of publications and the number of citations each author has received, the Hirsch index (h-index) is used.

According to the results, taking as reference date December 2020, the most outstanding researcher is Ron Goetzel from Johns Hopkins University, with 39 articles. Additionally, he has a total of 67 086 citations, and an h-index of 59, according to Google Scholar.

Next is Enid Chung Roemer of the John Hopkins Bloomberg School of Public Health with 16 articles, 966 citations and an h-index of 15, according to Google Scholar. In third place is Peggy Hannon of the University of Washington, with 15 articles, a total of 3 520 citations and an h-index of 32 according to Google Scholar.

TABLE 1.

Researchers with the highest number of publications on WHWP in WoS and Scopus databases during 2001-2020.

Name of Author	University	Papers on WHWP in Scopus	Papers on WHWP in WoS	Total Papers on WHWP	Total number of citations of the author	Author H-index
Goetzl, Ron Z.	Johns Hopkins University	18	21	39	67.086	59
Roemer, Enid Chung	Johns Hopkins Bloomberg School of Public Health	7	9	16	966	15
Hannon, Peggy A.	University of Washington	8	9	15	3.520	32
Mattke, Soeren	RAND Corporation	9	6	15	10.775	40
Harris, Jeffrey R.	University of Washington	7	7	14	8.656	47
Liu, Hangsheng	RAND Corporation	7	7	14	1372*	31**
Pronk, Nicolaas P.	Health Partners Institute, Harvard School of Public Health	4	8	12	10.301	53
Merrill, Ray M.	Brigham Young University	8	3	11	15.149	68
Jinnett, Kim	University of California, San Francisco	6	5	11	1209*	26**
Newman, Lee S.	Colorado School of Public Health	5	5	10	16.164	71

* Number of citations according to Research Gate.

** Research Gate (RG) Score.

Source: Own elaboration.

Table 2 lists the ten journals with the highest number of publications, among which the *Journal of Occupational and Environmental Medicine* stands out with 11.30% and the *American Journal of Health Promotion* with 8.17% of the total number of publications.

TABLE 2.
*Journals with the highest number of publications on WHWP
 in WoS and Scopus databases during 2001-2020.*

Name of the journal	WoS Publications	Scopus Publications	Total Publications	Percentage
Journal of Occupational and Environmental Medicine	68	62	130	11.30%
American Journal of Health Promotion	45	49	94	8.17%
International Journal of Workplace Health Management	17	17	34	2.96%
Population Health Management	11	16	27	2.35%
Bmc Public Health	12	10	22	1.91%
Workplace Health Safety	9	11	20	1.74%
Health Affairs	9	10	19	1.65%
Journal of Workplace Behavioral Health	6	12	18	1.57%
Preventing Chronic Disease	10	7	17	1.48%
Progress in Cardiovascular Diseases	5	9	14	1.22%
Others	307	448	755	65.65%
Total	499	651	1150	100.00%

Source: Own elaboration.

Table 3 shows the country of origin, category, quartile, SCImago Journal Rank (SJR) 2020 and H Index indicators, taking as a reference the ranking established by Scimago Journal and Country Rank. Of the ten journals mentioned with the highest number of publications, 70% correspond to publications in journals from the United States and 30% to the United Kingdom.

80% correspond to the category “Public, environmental and occupational health”. Likewise, 60% are in Q1 classification. The journal with the best rating is “Health Affairs”, since it has the highest scores in the SJR 2020 = 3.84 indicators and an h-Index = 178.

TABLE 3.

Country of origin, category, quartile, SJR 2020 and H Index indicators of journals with the highest number of publications on WHWP in WoS and Scopus databases during 2001-2020.

Name of the journal	Country	Publisher	Category	Quartile	SJR 2020	H Index
Journal of Occupational and Environmental Medicine	USA	Lippincott Williams and Wilkins Ltd.	Public Health, Environmental and Occupational Health	Q2	0,71	110
American Journal of Health Promotion	USA	SAGE Publications Inc.	Public Health, Environmental and Occupational Health	Q1	0,89	91
International Journal of Workplace Health Management	United Kingdom	Emerald Group Publishing Ltd.	Public Health, Environmental and Occupational Health	Q3	0,32	21
Population Health Management	USA	Mary Ann Liebert Inc.	Public Health, Environmental and Occupational Health	Q1	1,00	40
BMC Public Health	United Kingdom	BioMed Central Ltd.	Public Health, Environmental and Occupational Health	Q1	1,23	143
Workplace Health Safety	USA	SAGE Publications Inc.	Public Health, Environmental and Occupational Health	Q2	0,40	38
Health Affairs	USA	Project Hope	Health Policy	Q1	3,84	178
Journal of Workplace Behavioral Health	USA	Routledge	Public Health, Environmental and Occupational Health	Q3	0,44	17
Preventing Chronic Disease	USA	Centers for Disease Control and Prevention (CDC)	Public Health, Environmental and Occupational Health	Q1	1,17	77
Progress in Cardiovascular Diseases	United Kingdom	W.B. Saunders Ltd	Cardiology and Cardiovascular Medicine	Q1	1,93	100

Source: Own elaboration.

WHWP Science Tree

Taking as reference the 499 articles exported from the WoS database, ToS algorithm was applied, an algorithm validated in various fields of knowledge by several researchers such as: [Buitrago et al. \(2019\)](#), corporate branding; [Landinez et al. \(2019\)](#), executive function performance in patients with obesity; and [Duque and Cervantes-Cervantes \(2019\)](#), university social responsibility.

The existence of hegemonic or classic, structural and current publications was identified. **Figure 2** shows the ToS with respect to the research carried out. It contains 80 articles in total, of which ten correspond to the root type, another ten to the trunk type, and sixty belong to the leaf category.

Once the articles of greatest interest had been selected, taking as a reference criterion those with the highest number of co-citations, the most relevant elements of WHWP were analyzed. The objective of this methodology is to know from a research point of view what are the most relevant characteristics of WHWP, its execution, the measurement of its impact and the existing opportunities for improvement in its implementation.

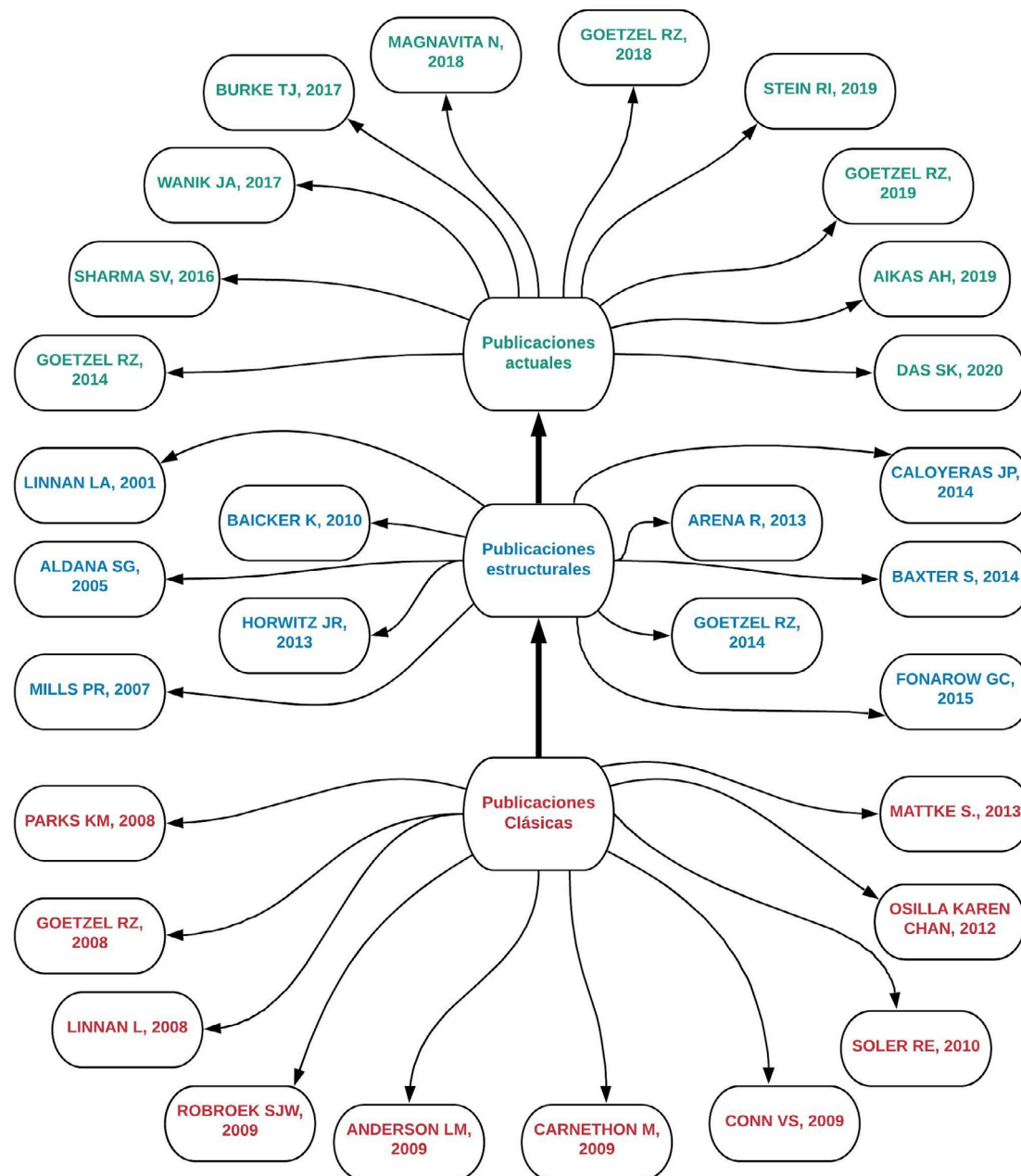


Figure 2. Science Tree 2001-2020 Workplace Wellness and Health Programs. Source: Own elaboration.

From each of the categories, three representative articles were selected for analysis based on their level of co-citations, which are presented in **Table 4**:

TABLE 4.
Major publications Workplace Wellness and Health Programs 2001-2020.

Root (Classical-hegemonic publications)	Trunk (Structural Publications)	Sheets (Recent publications)
The Health and Cost Benefits of Work Site Health-Promotion Programs Goetzel, R. Z., and Ozminkowski, R. J. (2008)	Workplace Wellness Recognition for Optimizing Workplace Health Fonarow, G. C., Calitz, C., Arena, R., Baase, C., Isaac, F. W., ... Lloyd-Jones, D. (2015)	What Can You Achieve in 8 Years? A Case Study on Participation, Effectiveness, and Overall Impact of a Comprehensive Workplace Health Promotion Program Aikas AH, 2019
Results of the 2004 National Worksite Health Promotion Survey Linnan, L., Bowling, M., Childress, J., Lindsay, G., Blakey, C., Pronk, S., ... Royall, P. (2008)	Do Workplace Health Promotion (Wellness) Programs Work? Goetzel, R. Z., Henke, R. M., Tabrizi, M., Pelletier, K. R., Loeppke, R., Ballard, D. W., ... Metz, R. D. (2014)	Sustained Long-Term Effectiveness of an Energy Management Training Course on Employee Vitality and Purpose in Life Das, S. K., Mason, S. T., Vail, T. A., Blanchard, C. M., Chin, M. K., Rogers, G. T., ... Turgiss, J. L. (2019)
Meta-Analysis of Workplace Physical Activity Interventions Conn, V. S., Hafdahl, A. R., Cooper, P. S., Brown, L. M., and Lusk, S. L. (2009)	Impact of a Health Promotion Program on Employee Health Risks and Work Productivity Mills, P. R., Kessler, R. C., Cooper, J., and Sullivan, S. (2007)	Framework for Evaluating Workplace Health Promotion in a Health Care Delivery Setting Goetzel, R. Z., Berko, J., McCleary, K., Roemer, E. C., Stathakos, K., Flynn, P. R., ... Nevola, G. (2019)

Source: Own elaboration.

Hegemonic publications

The three hegemonic publications, which constitute the research basis for the design, implementation and measurement of Health Promotion and Workplace Wellness Programs, are listed below:

For **Goetzel and Ozminkowski (2008)**, the proper design and implementation of Health Promotion Programs in the workplace can increase employee health and productivity. The main characteristics of effective programs are: ability to assess service needs, strategies to attract participants, application of behavioral theory, incorporation of internal customer marketing, and measurement of program impact.

In reviewing the results of the 2004 National Workplace Health Promotion Survey in the United States (**Linnan et al. 2008**), concluded that there is more need to implement regular monitoring of effectiveness based on the evidenced results of the implementation of health promotion and protection programs, than to increase the number, quality, and types of programs.

For their part, [Conn, Halfdahl, Cooper, Brown and Lusk \(2009\)](#) in conducting a meta-analysis of available data on workplace physical activity interventions reported from 1969 to 2007, found that some workplace physical activity interventions can improve both the health of workers and generate important outcomes in other organizational variables.

Structural publications

Three structural publications are identified below, which complement the theory of the design, implementation and measurement of Health Promotion and Workplace Wellness Programs:

According to [Fonarow et al. \(2015\)](#), the workplace is an important setting for promoting cardiovascular health and preventing stroke in the United States. Well-designed, comprehensive WHWPs have the potential to improve cardiovascular health and reduce mortality, morbidity, and disability resulting from cardiovascular disease and stroke. However, widespread implementation of comprehensive wellness programs is lacking.

[Mills et al. \(2007\)](#) identified that multicomponent Occupational Health Promotion Programs can produce considerable changes in health risks and organizational productivity. In addition, there is a relationship between health risks and indirect business costs.

[Goetzel et al. \(2014\)](#) note evidence accumulated over the past three decades showing that well-designed and executed programs, grounded in evidence-based principles, can achieve positive employee health outcomes and financial benefits for the organization.

Current publications

Finally, three publications (sheet articles), which complement the systematic review of existing literature, are presented:

For [Äikäs et al. \(2019\)](#), best practices for workplace health promotion consider implementation with continuous evaluation, organizational commitment, inclusion of management and employees, focus on behavioral changes, which in general leads to better health and productivity outcomes at the individual and company level.

Regarding the evaluation of a workplace wellness program [Goetzel et al. \(2019\)](#) conclude that analyses of structural, process, and outcome variables will provide that organization with valuable information about the strengths and weaknesses of its wellness program.

According to [Das et al. \(2020\)](#), wellness can greatly influence health status, health service use, productivity, and work performance. Given that employees spend eight hours at work on an average day, researchers have identified the workplace as an ideal environment for disseminating health promotion programs.

After acknowledging some of the most representative articles in each of the categories, a closer look at WHWP research perspectives identified from the co-citation analysis is presented below.

WHWP research perspectives: a co-citation analysis

Figure 3 presents the complete network of co-citations on the WHWP topic, this network has 16 perspectives, 2233 nodes (articles) and 6967 edges (links or references between articles). The nodes or points represent the publications, their size represents the number of citations (references) received and the edges represent the links or citations or references between them. This network was obtained through the Gephi visualization software (Bastian, Heymann & Jacomy, 2009).

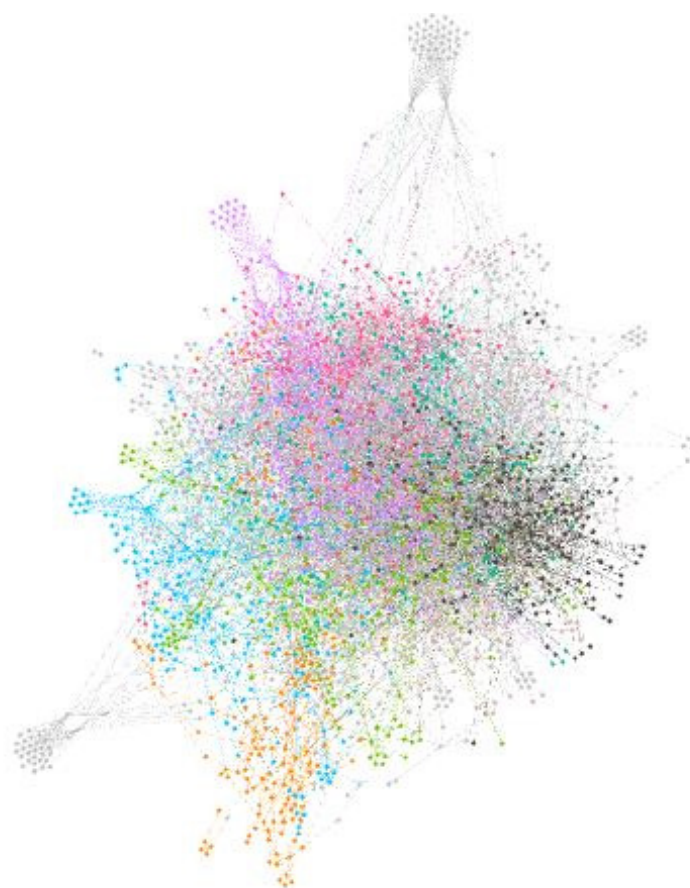


Figure 3. Complete WHWP co-citation network 2001-2020.
Source: Own elaboration.

Figure 4 presents the selection of the three main perspectives of the aforementioned co-citation network. The selected perspectives represent 32% of the total network, with 722 nodes and 1339 edges. According to the analysis of co-citations, three main perspectives related to WHWPs were found: I) Health promotion and prevention (**Figure 5**); II) Burnout intervention and prevention of mental stress (**Figure 6**); and III) Prevention of the effects of obesity through physical activity (**Figure 7**).



Figure 4. Network of co-citations main prospects WHWP 2001-2020.
Source: Own elaboration.

*Perspective 1:
Health promotion and prevention*



Figure 5. Perspective 1. Health promotion and prevention.
Source: Own elaboration.

This first perspective consists of 269 nodes, which corresponds to 12% of the total number of articles in the main network, and is made up of research that focuses on Occupational Health Promotion and Prevention Programs. In the Colombian context, this approach is related to the activities of preventive and occupational medicine established in the framework of the Occupational Safety and Health Management System, which is regulated in Colombia by the **Single Regulatory Decree of the Labor Sector 1072 (2015)**.

Among the classic articles, its focus on the characteristics of the programs and the measurement and its impact on employees stands out. The research of **Goetzel and Ozminkowski (2008)** stands out, after reviewing the state of the art of WHWP and describing the characteristics of effective programs, including their ability to assess the need for services, attract participants, use behavioral theory as a basis, incorporate multiple ways of reaching people and measure the impact of the program.

Along the same lines, **Linnan et al. (2008)** examined workplace health promotion programs, identifying that there is a need to regularly monitor and implement program delivery through objective measurement and increase the number, quality and types of programs.

Regarding studies measuring the impact of WHWP implementation, **Henke, Goetzel, McHugh and Isaac (2011)** evaluated the effect of the program on health risks and health care costs of employees of the US multinational Johnson and Johnson during the period 2002-2008. They observed that the company's employees benefited from significant reductions in rates of obesity, high blood pressure, high cholesterol, tobacco use, physical inactivity and poor nutrition. Finally, they identified that the average annual savings per employee was \$565 dollars, taking 2009 as the baseline year.

On the other hand, a review of the structural articles from this perspective highlights, from the point of view of measuring the impact of WHWPs, the research of **Goetzel et al. (2014)**, who, upon reviewing the evidence accumulated over the last three decades, concluded that well-designed and executed programs based on evidence-based principles can achieve positive results from the financial and health points of view.

Likewise, **Fonarow et al. (2015)** proposed a WHWP model founded primarily on generating a culture of health and achieving rigorous cardiovascular health standards. Similarly, **Kent, Goetzel, Roemer, Prasad and Freundlich (2016)** identified that best practices in WHWP implementation include the establishment of a culture of health in the organization and the strategic use of communications.

Finally, among the most current articles in this perspective continues the focus on evaluating the impact of its implementation. **McCleary et al. (2017)** reviewed the status of WHWPs in the United States from the employer and employee perspective concluding that, although such programs are offered in

most workplaces, employees are not aware of them. For their part, [Äikäs et al. \(2019\)](#), in a case study after eight years of implementing a WHWP, assessed its effectiveness and impact as moderate.

[Weaver et al. \(2020\)](#) identify as fundamental the continuous re-evaluation of WHWPs, which may represent a greater commitment and investment in such initiatives. Other factors that can positively influence the impact of WHWPs include company size, access to external resources and organizational experience in their implementation.

*Perspective 2:
Burnout and mental stress intervention*

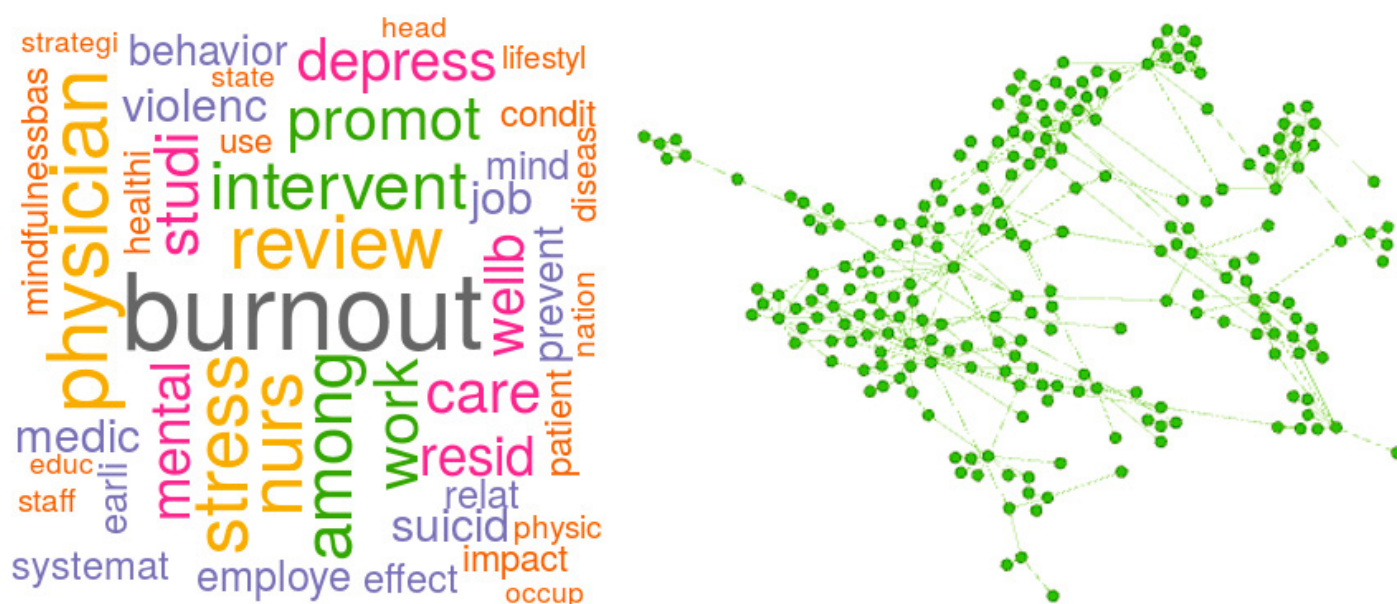


Figure 6. Perspective 2. Prevention of burnout and mental stress.
Source: own elaboration.

This second perspective consists of 227 nodes, which corresponds to 10% of the total number of articles in the main network and is mainly composed of research that focuses on the prevention of burnout syndrome and the intervention of employees' mental stress. [Maslach, Schaufeli and Leiter \(2001\)](#) identified Burnout Syndrome as a prolonged response to chronic emotional and interpersonal stressors at work. They also state that engagement is the positive antithesis of burnout and that it offers new perspectives of intervention to alleviate it, which generates a different and valuable contribution to the health and well-being of

employees. In this sense, **Wallace, Lemaire and Ghali (2009)** reviewed the work-related stresses faced by physicians, the existing barriers to address their well-being and the consequences for the individual and the health care systems of an inadequate implementation of WHWPs.

Similarly, **Shanafelt et al. (2012)** investigated in the United States on Burnout Syndrome within the medical population in relation to the general population, concluding that its presence is more common among physicians than among other workers. Following this review, there is an emphasis on the practical study of the results of the implementation of WHWP on the mental health conditions and behaviors of employees. In this sense, **Kravits, McAllister-Black, Grant and Kirk (2010)** identified the importance of psychoeducational interventions, the implementation of wellness activities such as practice with relaxation techniques and exploration of coping patterns, with the aim of reducing stress and preventing burnout in the nursing population. **Schopp, Bike, Clark and Minor (2015)** conducted a comparison study between an experimental group and a control group, they identified that the implementation of a WHWP significantly improved behaviors.

Kurnat-Thoma, El-Banna, Oakcrum and Tyroler (2017) conducted case study research at Washington Hospital-USA, taking nursing staff as the specific research population, concluding that nurses over 40 years of age had greater participation in WHWP activities and showed greater benefits in terms of maintaining healthy lifestyles, personal well-being, and positive interpersonal relationships. More recent articles from this perspective continued primarily with an applied research focus. **Gregory, Menser and Gregory (2018)** conducted an intervention-control group experiment to measure changes in medical staff burnout, the results showed significant impacts, with an improvement in workload and a decrease in the emotional exhaustion dimension.

Arnold et al. (2018) focused on the medical resident sector, identifying the importance of the training component in WHWPs for the establishment of a culture of wellness and the improvement of physical and mental health conditions of medical staff. Finally, **Hilton, et al. (2019)** conducted a review on mindfulness as a workplace wellness tool to prevent Burnout Syndrome providing an overview of available evidence on the topic to inform policy and organizational decision making that supports wellness. **Lessard, Wilkins, Rose-Malm and Mazzocchi (2020)** found limited evidence regarding the correlation between health promotion interventions and mental and physical health conditions. **Davidson, Accardi, Sanchez, Zisook and Hoffman (2020)** show another course of action regarding employee wellness actions: a suicide prevention program in a population of nurses implemented over three years, concluding that it is well received and proved to be effective.

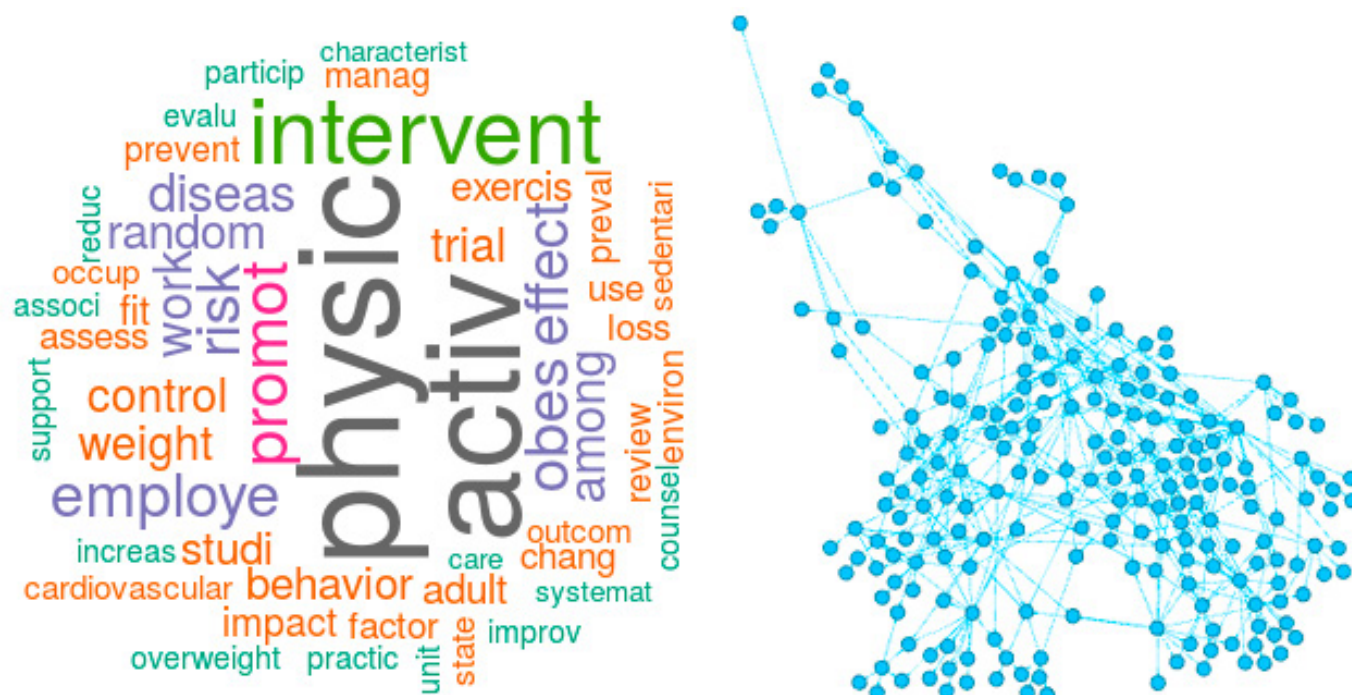
*Perspective 3:**Intervention in overweight and obesity through physical activity*

Figure 7. Perspective 3. Intervention in overweight and obesity through physical activity.
Source: Own elaboration.

This third perspective has 226 nodes, which corresponds to 10% of all the articles in the main network and is mainly composed of research that focuses on intervention in overweight and obesity prevention through the practice of physical activity. Regarding the structural articles, there is a focus on conducting a systematic review of the literature on the effectiveness of WHWPs. Dishman, Oldenburg, O'Neal and Shephard (1998) indicate that typical WHWP activities have not yet demonstrated a statistically significant increase in employee physical activity.

Anderson et al. (2009) identify that most of the interventions combined communicative and behavioral influencing strategies to modify dietary habits and physical activity. Likewise, they found that a smaller number of interventions modified the work environment to promote healthy choices.

Regarding structural articles, continuity in the impact evaluation approach of WHWPs is observed. Gazmararian, Elon, Newsome, Schild and Jacobson (2013) evaluated the effectiveness of intervening in the framework of WHWP implementation and the multiple existing barriers to physical activity. Pronk (2015) noted that employers should identify best practices leading to the design of more effective

WHWPs. [Gutermuth, Hager and Pollack \(2018\)](#) conducted a systematic literature review of eighteen WHWPs identifying significant improvements in employee physical activity in eleven of them.

Regarding WHWP sheet-type articles, a focus on identifying the relationship between their implementation and the effects on physical activity and productivity indicators was presented. [Kolbe-Alexander, et al. \(2012\)](#) and [Østbye et al. \(2013\)](#) argued the need for economic evaluation of WHWPs with the aim of generating new knowledge on the cost-effectiveness of their implementation. [Kolbe-Alexander, et al. \(2014\)](#) determined in a case study of the South African workforce where the availability of worksite wellness facilities generated improved physical activity and nutritional habits.

Finally, [Von Thiele and Lindfors \(2015\)](#), taking as reference a population of women working in elderly care, investigated on the effects of physical exercise within a WHWP on productivity, work capacity and disease reduction. [Wanik, Marcus, Radler, Byham-Gray and Touger-Decker \(2017\)](#) identified that the level of physical activity is associated with the maintenance of anthropometric improvements among WHWP participants.

CONCLUSIONS

A bibliometric analysis of the existing literature in the WoS and Scopus databases shows that, during the last twenty years, there has been an increasing trend in the amount of research on WHWP. The most relevant authors in this topic based on the number of papers published are in order: Ron Z Goetzel, Enid Chung Roemer and Peggy A Hannon. The journals with the highest visibility are: *Journal of Occupational and Environmental Medicine*, *American Journal of Health Promotion* and *International Journal of Workplace Health Management*.

The application of the ToS algorithm has made it possible to construct the tree of science of the research published worldwide regarding WHWP during the last twenty years. The most relevant articles located at the root of the tree according to their level of co-citations, and which constitute the theoretical basis for the design, implementation and measurement of WHWP were elaborated by the following authors: [Goetzel & Ozminkowski \(2008\)](#), [Linnan et al. \(2008\)](#) and [Conn et al. \(2009\)](#).

The most important articles located in the trunk of the tree according to their level of co-citations, which are identified as structural and complement the theory of Health Promotion and workplace wellness Programs were elaborated by the following authors: [Mills et al. \(2007\)](#), [Goetzel et al. \(2014\)](#) and [Fonarow et al. \(2015\)](#). Finally, reference articles on tree leaves are identified as those presented by: [Äikäs et al. \(2019\)](#) and [Das et al. \(2020\)](#).

Finally, the leaf articles complement the systematic review of existing literature and identify good practices for workplace health promotion such as: implementation with continuous evaluation, a commitment from the organization, management and

employees, focus towards behavioral change, which overall leads to better health and productivity outcomes at the individual and company level. Involvement is a crucial element for employee health outcomes (Äikäs et al., 2019 and Goetzl et al., 2019).

According to the co-citations analysis conducted by the present study, three research perspectives related to WHWPs are observed, they are:

1. Promotion and prevention in health: it is conformed by researches that have as focus the Programs of Promotion and Prevention in Health at Work.
2. Intervention of mental stress and burnout prevention: it is mainly made up of research that focuses on the intervention of burnout syndrome and mental stress of employees.
3. Prevention of the effects of obesity through physical activity: it is mainly made up of research that focuses on the intervention of overweight and obesity through the practice of physical activity.

Considering that the literature on workplace health and workplace wellness identified in this review has been generated mainly in the United States and the United Kingdom, this article presents some practical limitations for the application of its results in the Latin American context. Likewise, it is concluded that, given the scarcity of studies on these topics in Colombia, it is necessary to carry out future research to serve as an academic and organizational reference.

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