



Loneliness in the Workplace; Knowledge Mapping

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Today, especially in the coronavirus and post-coronavirus era, research on "loneliness in the workplace" has received more attention than ever before. The main goal of this research is to investigate the current state of knowledge related to loneliness in the workplace in scientific publications. To achieve this goal, the trend of research conducted from 1966 to 2022 was analyzed using bibliometric analysis and through VOSviewer software. A total of 2240 documents were retrieved from the Web of Science database and the findings showed that the highest percentage of studies on loneliness in the workplace were conducted in 2021. United States, China, and England have contributed the most to studies and the majority of studies are in the field of management and communication sciences. Williams, KD has the most references among the authors, and the keywords of alienation, ostracism, and in recent studies the keywords of loneliness have appeared in the workplace. The results of this research have opened a new vision to researchers who are interested in this field, helped to better understand this phenomenon, and provided suggestions for future research.

Keywords: *Loneliness in the Workplace, Knowledge Map, Bibliometric Analysis, VOSviewer*

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Abstract

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Introduction

As social beings, humans need social interaction and maintaining close relationships. If this need is not met, the individual can easily experience feelings of loneliness (Weiss, 1973). Since the workplace is a context where employees socialize with their colleagues (Çetin, 2021), if relatedness needs are not met in an organizational society and meaningful relationship in organizations becomes a wish, loneliness appears in the workplace (Wright and Silard, 2021). Hence, the characteristics of the workplace may be considered as "stimulating factors of loneliness" (de Jong-Girold, 1987, p. 127). Specifically, the roots of loneliness in the workplace seem to include a wide variety of organizational factors, such as an inappropriate social and emotional climate, poor job design, poor management practices, job rotation, and promotion (Wright, 2005).

On the other hand, vast changes in society and rapid economic development have created many challenges in the workplace. These challenges to different degrees lead to the feeling of loneliness in the workplace.

- First, the change in working methods has made many tasks to be done independently. The tendency towards group or collective work will decrease day by day. It becomes difficult to find opportunities and conditions to establish interpersonal relationships among employees. This independent work system makes many employees unable to feel the nature of being a member of a team or organization, and in a long period of isolation, they may feel loneliness in the workplace (Zhou, 2018).
- Secondly, with the advent of the age of information and digital communication, the psychological distance between people has increased and the problem of loneliness has become more common so that few people can avoid this kind of experience in their lives (Wright, 2005). In the workplace, due to the popularity of network technology and the emergence of virtual teams, most employees transfer information through social networks, as a result of this, the opportunities for face-to-face communication are reduced, and it is difficult to establish intimate contact between organizational members and the effects Loneliness is highlighted in the workplace (Lam & Lau, 2012).

- Thirdly, in the new norm of Corona, loneliness in the workplace has become an important phenomenon (Bartholomeusz et al., 2021). Unlike in the past, employees feel lonelier at work during the coronavirus (Kniffin et al., 2020). In particular, new work arrangements during the Corona epidemic, such as remote work, flexible work, and flexible working hours, have created some obvious negative effects on the emotional and psychological health of employees (Wang et al., 2020).

As mentioned above, loneliness in the workplace has become a universal concept and the research about it has increased. A review of studies and documents in the Web of Science citation database shows that more than 50% of research in the field of loneliness in the workplace has been in recent years and since 2019. Due to an increasing trend of research on loneliness in the workplace, the bibliometric study is necessary to comprehensively review the results of research and get a comprehensive insight into the results of past research for conducting new ones. In addition, until now, a systematic study that graphically shows the process of studying loneliness in the workplace has not been done, and no knowledge map has been presented in this field.

The current research aims to present the knowledge map of loneliness in the workplace, which shows the big picture of the state of the research, the way different fields are connected, and the knowledge of how these fields grow and develop over time. The present study, with a new perspective, scientifically evaluates a series of research conducted since 1966 in the field of loneliness in the workplace and opens a new insight for those interested in this field. This research, using bibliometric analysis, facilitates the evaluation of the progress of knowledge about loneliness in the workplace (Uribe-Toril et al., 2018). This article is a guideline for researchers in identifying research gaps, thematic focus, and hot topics in the field of loneliness in the workplace (Durieux and Gevenois, 2010).

To achieve this goal, the trend of research conducted from 1966 to 2022 was analyzed using the bibliometric analysis technique and through VOSviewer software. A total of 2240 documents were obtained from the Web of Science database. The first part of this article describes the theoretical foundations and research background. The second part explains the methodology and systematic review through VOSviewer software. The

third part shows the results based on scientific mapping and their analysis. The last part includes a conclusion and presents the future research agenda. In general, this research seeks to answer the question of what the status quo is for studies of loneliness in the workplace based on the year, the subject area, the participation of countries, the authors, and the terminology.

Theoretical Foundations and Research Background

History and Definition of Loneliness; From loneliness in general to workplace loneliness

Rolheiser (1979) believes that no person, regardless of being rich or poor, is free from the pain of loneliness and there is no distinction between them in facing and fighting the potentially paralyzing phenomenon called loneliness (Mohapatra et al., 2020). Loneliness is a common phenomenon that has been recognized since ancient times. In the 17th century, Because the majority of people were located several miles apart, people identified the cause of loneliness. Loneliness was only associated with the fear or danger of being too far from society, which limited one's protection and safety. (Riggins, 2020). Before the 18th century, the word "loneliness" rarely appeared in English (Worsley, 2018). According to Bound (2018), before that time, the term simply referred to the state of being alone without any hint of emotional connection. Today, being alone means more than just being away from other people; It's a sense of being apart from other people beyond physical isolation (Worsley, 2018). Loneliness, according to Cherry (2018), is a human emotion and mental state. Loneliness is further defined as "a psychological phenomenon that is a state of mind rather than an objective condition" by Zysberg (2015) (p.1). According to Ozcelik and Barsade (2018), loneliness is more than just a feeling; it's also a sense that one's social environment lacks close relationships. Tanskanen and Anttila (2016) put it simply: "Loneliness is a phenomenon of one's mind." Based on Hawkey et al. (2008), the quality of relationships, not the quantity of friends, is what matters. The physical presence of people in one's social environment is important, but it is no longer a sufficient condition. A person needs to feel connected to others in order not to feel alone (Cacioppo et al., 2015). Even people who are not socially isolated may suffer from loneliness (Cacioppo & Cacioppo, 2014). It is noteworthy that most research on loneliness tends to focus exclusively on personal characteristics as the main

determinants of loneliness and largely ignores the environment (for example, the workplace) as a potential driver of loneliness. There are social situations and environmental characteristics that can lead to loneliness. For a better understanding of the concept of loneliness, one should not only pay attention to the personality but also pay attention to the ways that the social environment affects the person and causes loneliness.

workplace loneliness differs from loneliness in general. Workplace loneliness is expressed as an emotional state that happens once the standard of interactions in an organization is desired. Most commonly, loneliness is defined as being left alone and isolated by the lonely person's social environment, such as co-workers or leaders. They described workplace loneliness as 'the distress caused by the perceived lack of good quality interpersonal relationships between employees in a work environment'. Erdil and Ertosun (2011), consider workplace loneliness as a "workplace-specific emotion and coexists with certain characteristics of the working environment such as competitive climate, virtual teams, and alternative work arrangements".

The literature specifies two types of loneliness: both positive and negative.

Negative loneliness is related to dissatisfaction that results from the inferiority, compared with expectations, of individuals' relationships with their environment, whereas positive loneliness is defined as the voluntary movement of individuals away from their problems. The claim made in 1982 by Peplau and Perlman, that individuals' feelings of loneliness mean something other than being alone, seems quite meaningful at this point (Uslu, 2021). Also, according to Wright et al. (2006), loneliness in the workplace is a reflection of negativity and disappointments in the quality of social interactions and personal relationships, and it is an unfavorable mental state that is caused by the lack of interpersonal relationships (in terms of quality) and the inability to socialize.

Dimensions of Workplace Loneliness

Regarding loneliness, two general distinctions are made in the literature. The first is social loneliness as a result of a lack of social connections or friendships that are satisfactory. The other is emotional loneliness brought on by a lack of satisfying romantic relationships or close emotional

commitment (Russell et al., 1984). Similarly, Wright et al. (2006) also defined the concept of workplace loneliness in two ways. Emotional deprivation is one of the dimensions used to measure the quality of workplace interpersonal relationships. This dimension has a structure that is similar to emotional loneliness and includes concepts like feeling, being alone, and being alienated. Within the context of whether or not workplace social networks are adequate, the second dimension is defined as social companionship. This dimension also resembles social loneliness because it involves expressions like spending time with others, sharing, and being a part of the group. Therefore, when a person feels lonely in the workplace, both socially and emotionally, it is called loneliness in the workplace. In addition, the dimensions of loneliness among school principals include two components loneliness, one of which is associated with the feeling of abandonment about one's supervisor, and the other is loneliness, which is characterized by the feeling of alienation from school staff (Dor-Haim, 2021).

Loneliness: overlaps with other similar constructs

The incremental validity of the concept of loneliness in comparison to similar concepts like solitude, isolation, aloneness, being ostracized, and being alienated has frequently been questioned. Firoz and Chaudhary (2021) highlight the differences and similarities between each of these constructs and how loneliness relates to them.

Solitude

Isolation is an inevitable, pleasurable, and restoring experience uninhibitedly picked by an individual (Wright et al., 2006). Loneliness, on the other hand, is imposed on people and is a negative emotional state that the majority of people try to avoid (Marano, 2003).

Isolation

Workplace isolation is a form of cold violence at work. This means that despite the individual's subjective intention to become a member of the group, organizational support has pushed him out of the network. Isolation at work is an objective phenomenon in the social environment of an organization. It has passive characteristics, and loneliness at work

accentuates the subjective feelings of employees within the organization, both of which can cause great psychological stress and harm to individuals. Individuals find it more difficult to change this type of objective situation. In general, researchers believe that workplace isolation is a predictor of workplace loneliness (Zhou, 2018). Although it has been noted that isolation is the most common cause of loneliness, these are two different situations (Ernst and Cacioppo, 1998). Isolation can be voluntary or involuntary detachment from others. It indicates a lack of social interaction and aloofness from others. However, loneliness is thought to be imposed on individuals (Marano, 2003), and it is more dependent on the quality rather than quantity of social interactions. It is possible for an individual to feel lonely without being isolated, and vice versa.

Aloneness

An individual's desire for aloneness is a social experience used to demonstrate self-sufficiency. According to Burger (1995), people's perceptions of and responses to aloneness can vary significantly, ranging from happiness to loneliness. It typically refers to the sensation of being alone rather than being far from others (Wright et al., 2006). However, as previously stated, loneliness refers to an undesirable social reality brought on by unmet emotional and social needs.

Ostracism

Essentially, ostracism can be characterized as the degree to which people see that they are ignored or rejected by others (Ferris et. al., 2008). Ostracism can also be thought of as a general term that includes social exclusion (being kept apart from others, alone, or isolated) and non-acceptance (an explicit declaration that an individual or group is not wanted, Ayoko, 2022). When this phenomenon is compared to loneliness, the deeper injury caused by ostracism takes a longer time to heal (Wesselmann et al., 2012).

Alienation

Seeman (1959) in the initial analysis of the concept of alienation, identified five dimensions of alienation: powerlessness, self-estrangement, normlessness, isolation, and meaninglessness. According to Marx, the

alienation associated with work is the conflict between the nature of the work role and the nature of it representing the human being. It is a situation in which a person has lost control over the output of his work, the necessary process of work, and thus the ability to express himself at work. Therefore, it is the nature of work in the modern workplace that creates a sense of alienation at work, especially specialization at work and lack of control over work activities. Contrary to loneliness, alienation refers to cultural, and social isolation or alienation from oneself (Bell, 1985). Although alienation is different from loneliness, unwanted and undesirable alienation can create feelings of loneliness in people (Wright et al., 2006).

Research Overview

Paying attention to the word loneliness in the workplace seriously started from the study done by Wright in 2005. Since then, many studies have been done regarding the importance of loneliness in the workplace. Table 1 shows some of the studies conducted in the field of loneliness in the workplace.

Table 1. A review of studies conducted in the field of loneliness in the workplace

Author	Year	Title	Conclusion
Ayazlar and Guzel	2014	The effect of loneliness in the workplace on organizational commitment	Loneliness in the workplace negatively affects organizational commitment
Akcit and Barutcu	2017	The Relationship between performance and loneliness in the workplace	The findings showed that there is a negative relationship between loneliness in the workplace and performance
Ozcelik and Barsade	2018	No employee an island: Workplace loneliness and job performance	The findings indicate that loneliness in the workplace leads to low employee performance
Zumaeta	2019	Lonely at the top: How do senior leaders navigate the need to belong?	The findings showed that senior managers are prone to loneliness due to role pressures, such as increased social distance, lack of social support, and role burnout.

Author	Year	Title	Conclusion
Savafi firmahalleh et al.	2022	The Effect of Organizational Bullying on Employees' feeling of Loneliness Through Mediating role of Abusive Supervision and Emotional Blackmail	The results indicated that organizational bullying has a positive and significant effect on the loneliness feeling of employees in the organization
Fakhimi anafsheh et al.	2020	The Impact of Entrepreneurial Orientation and Loneliness of Managers on the Relation between Job Stress and Job Burnout	The results show loneliness plays a significant mediating role in the relationship between job stress and burnout of managers.
Amini Brujen nd Moghadam	2023	The effect of Employees loneliness on career advancement with mediating effect of perceived organizational support	The findings showed that there is a negative and significant relationship between loneliness in the organization and risk-taking and trust in the organization
Ebrahimi and Keshavarz	2019	Investigating the Role of Emotional Deprivation, Social Companionship, and Loneliness in the Organization in Creating a Sense of Wellbeing in Work	<i>The results of the research confirmed the positive and significant effect of loneliness and well-being at work</i>

In reviewing the background of workplace loneliness, it was found that in most studies, researchers have focused on loneliness in the workplace as a variable and measured its effect on other organizational variables or vice versa. Therefore, in the previous studies, the lack of a comprehensive and integrated study is quite noticeable. Also, secondary research such as Firoz and Chaudhary (2021) and Zhou (2018) which were conducted by reviewing the literature, because it did not use quantitative and statistical techniques, could not determine the intellectual and knowledge structure of loneliness in the workplace and the evolution process in this field. Therefore, bibliometric analysis in this field can be useful for a better understanding of the concept of loneliness in the workplace, identifying research gaps, and reviewing the evolutionary process of studies. The bibliometric method does not have the limitations of a systematic review, which is a qualitative method that only examines a limited number of

studies and can be marred by interpretation bias from scholars across different academic backgrounds (Donthu et al., 2021). In addition, it goes beyond the review of quantitative and homogeneous studies, which is one of the requirements of methods such as meta-analysis. The advantages of this method, such as identifying hot topics and the evolutionary process of loneliness in the workplace with the help of citation analysis, are less found in other research methods.

In this research, the knowledge map of studies of loneliness in the workplace is presented using the graphic tool of VOSviewer software. In other words, this research seeks to answer the following questions:

- 1- What is the trend of workplace loneliness studies based on the year?
- 2- What is the category of documents based on the subject area?
- 3- Which countries contributed the most to the journals?
- 4- Which authors contributed the most to scientific and research publications on loneliness in the workplace?
- 5- How is the thematic evolution of loneliness in the workplace?

Methodology

Bibliometric analysis is a general tool used by researchers in various disciplines. Lately, the bibliometric evaluation has acquired a lot of significance as it permits detailed data about a specific. According to Garfield (1955), this useful method gathers a variety of mathematical tools and statistical techniques to review and analyze publications, for example, various articles and books, etc. It is the process of using statistical methods to explain a scientific research topic and highlight trends in the field. When compared to conventional framework building, this method is novel and innovative. As a result, bibliometric analyses enable the reader to learn about previous trends in the subject, shed light on recent developments, and provide hot topics for further research. (Durieux and Gevenois, 2010). The bibliometric analysis can be performed in two ways: performance analysis and science mapping. Word frequency, citation analyses, and count publications by country universities, research groups, or authors are included in the bibliometric performance analysis (Gaviria-Marin et al., 2019). The performance analysis was based on information from the Web of Science database for this study. The science mapping process enables to representation of the research's dynamic and structural aspects, as well as

the relationships among various scientific actors. For the current study, the VOSviewer was chosen among several contemporary mapping software applications.

Considering the main goal of the research, which is to draw a knowledge map to better understand the concept of loneliness in the workplace, to identify research gaps, to review the evolutionary process of studies, the current research requires a method that uses statistical techniques and take a look at all the studies and documents on loneliness in the workplace. The most suitable research method is bibliometric study. Unlike systematic literature reviews that tend to rely on qualitative techniques, which could be marred by interpretation bias from scholars across different academic backgrounds, bibliometric analysis, and meta-analysis rely upon quantitative techniques and thus can avoid or mitigate that bias. On the other hand, although meta-analysis and bibliometric analysis can both handle large amounts of literature, meta-analyses are often used as theory extension tools. In contrast, bibliometric analysis summarizes the bibliometric and intellectual structure of a field by analyzing the social and structural relationships between different research constituents e.g., authors, countries, institutions, and topics (Donthu et al., 2021). Therefore, in the present research, bibliometric analysis has been used, which does not have the limitations of meta-analysis, which focuses on the review of quantitative and homogeneous studies. We studied all the research in the field of loneliness in the workplace.

The data of this study were accessed through the Web of Science search engine on November 28, 2022. The research strategy looked for exclusively English-language studies in which the keywords "lonely*" OR "aleness" OR "alienation" OR "solitude" OR "lack of friends" OR "ostracism" were used concurrently with the "workplace " OR "organization*" OR "job" in titles, abstracts, keywords, and body text of all documents in the Web of Science database. The process of conducting the research was as follows: at first, the Web of Science database was selected to search for studies. The process of selecting resources at this stage was by looking at the inclusion and exclusion criteria; 2339 records were found, and after refining the results using the capabilities and facilities of this database, the final number of records was determined to be 2240 studies.

Results and Discussion

The purpose of citation analysis through VOSsoftware is to identify the most effective researchers, countries, subject areas, and distribution of the documents by publication year. In the following, the analysis of the findings will be presented based on the research questions.

The first research question: What is the trend of studies of loneliness in the workplace based on the year? Chart 1 shows the growth trend of studies in this regard.

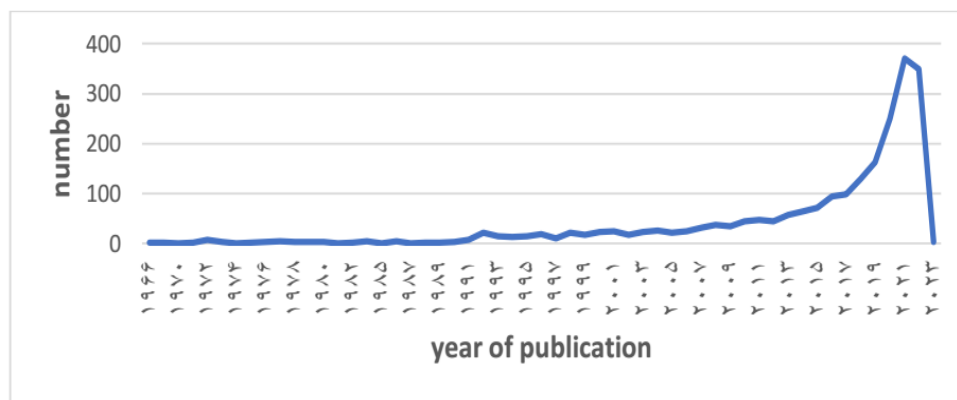


Chart 1. Distribution of the documents by publication year

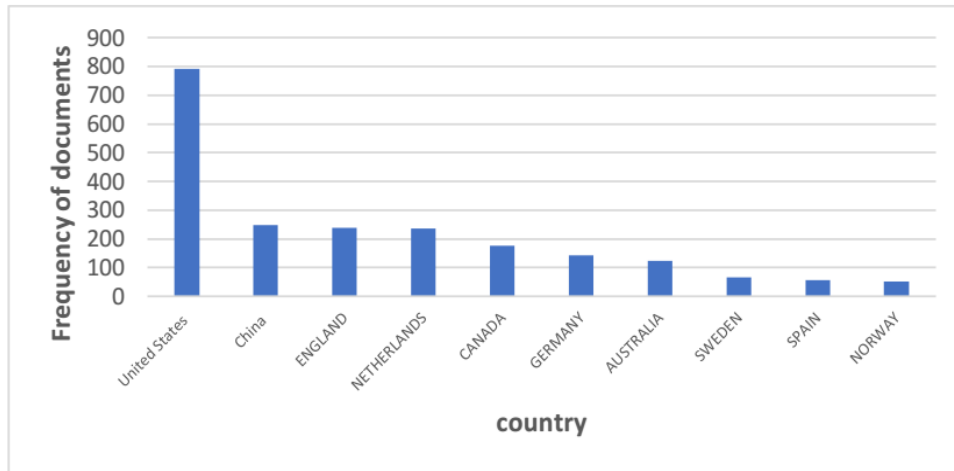
The most scientific publications about loneliness in the workplace are related to 2021, which has a share of about 16% (370 documentaries). The first studies related to 1966 are related to the issue of "alienation" in the organization.

The second research question: What is the category of documents based on the subject area? As table 2 shows, the Research Areas related to loneliness in the workplace is mainly in 9 areas in addition to other. About a third of the publications (31.56%) were in the area of "Management and Communication Sciences" followed by "Medical Sciences and Nursing" (30.59%). The lowest number of publications is related to "tourism" (1.161 percent) and "human geography" (1.161 percent). It is worth mentioning that 80 records (3.571%) have not been found in the Web of Science database due to the lack of clarity in the subject area of the analysis.

Table 2. Documents categorized according to their subject area

Research Areas	Record Count	Percent (%)	Research Areas	Record Count	Percent (%)
Management and Communication	707	31/565	Social and human science	59	2/634
Medical science and nursing	685	30/591	History and Philosophy of Science	43	1/921
Psychology	426	19/017	Drug abuse	35	1/563
Political Science	78	3/482	Human Geography	26	1/161
Other areas	75	3/351	Tourism	26	1/161

The third question of the research: Which countries contributed the most to the journals? In total, the Web of Science database contains articles from 108 countries/territories plus undefined countries on workplace loneliness. Overall, the top 10 European and Asian countries plus Australia are shown in chart 2.

**Chart 2. Distribution of the documents by country of origin**

According to chart 2, the largest number of publications is related to the United States (792 documents), followed by China (247 documents) and England (238 documents).

The fourth question of the research: Which authors contributed the most to research publications on loneliness in the workplace? Figure 1 shows the Co-citation analysis of the authors. Also, the number of references to authors can be seen in Table 3.

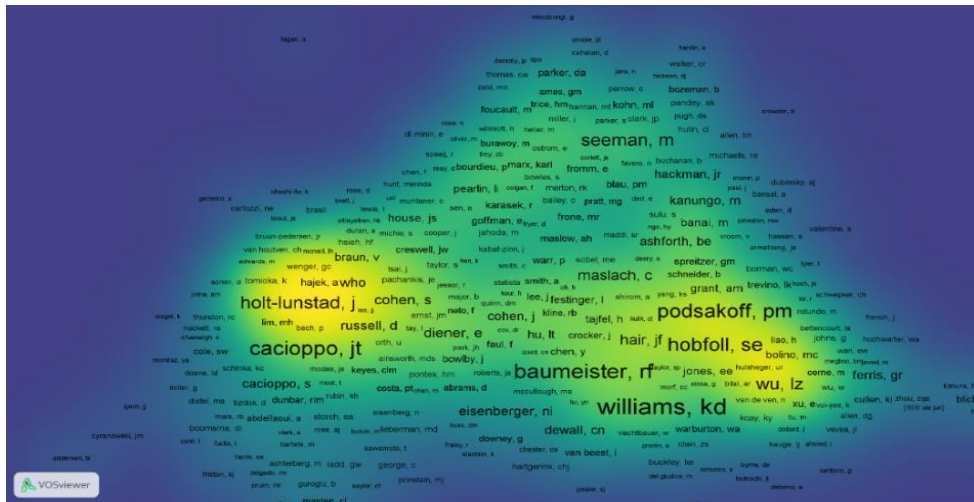


Figure 1. Density Visualization Map of the Co-citation by Author

Table 3: Names of authors based on the number of references to the author

Author	Number of references	Author	Number of references
Williams, kd	448	Podsakoff, pm	291
Ferris, dl	378	Hobfoll, se	260
Baumeister, rf	331	Holt-lunstad, j	215
Cacioppo, jt	299	Seeman, m	208

Based on the co-authorship network and the number of scientific and research productions of the authors, kwan, ho kwong (with 15 records), chung, yang woon (with 8 records), fatima, tehreem (with 8 records), koenig, hans-helmut (with 7 records), koyanagi, ai (with 7 records), smith, lee (with 7 records), van lier, pol (with 7 records) are the most used researchers in the field of loneliness in the workplace. But more important than the number of authors' research productions is the number of references

in other research productions to the works of an author. If the minimum number of references to each author is considered to be 3, the total number of authors is 6830.

The fifth research question: How is the thematic evolution of loneliness in the workplace? In this part of the research, the co-occurrence analysis of keywords is done to identify the topics that are often studied in the field of loneliness in the workplace and their relationship. The documents found in the Web of Science database from 1966 to 1985 were unverifiable and did not have any effect on the analysis because their authors did not have specified keywords of these researches. In this research, the minimum number of occurrences and relations of a keyword was considered to be 2 occurrences. In the following, it is explained the network visualization map of keywords co-occurrence and data density visualization map with keyword co-occurrence.

Network Visualisation Map of keywords co-occurrence in the field of loneliness in the workplace: In the network visualization map, nodes and lines in a bibliographic network are examined. It provides a network of keywords in which the color, size of the node, and thickness of the connecting lines show the relationship with other keywords (Sweileh et al., 2017). Each node represents a journal, article, or keyword, and the size of the node represents the frequency of occurrence of each keyword (i.e., the number of times that the keyword occurs). A line connecting nodes shows the co-occurrence of terms when they appear together or are related. The more occurrences, the bolder the lines between keywords (Donthu et al., 2021). At this stage, to find the roots and search terms more suitable for and to better examine the evolutionary process of loneliness in the workplace, network visualization has been used in 3 periods before 2006, 2006-2015 and after 2016. Since new studies about loneliness in the workplace have been seriously conducted since 2006 by Sarah Wright, therefore, the 2006 period has been chosen as the basis.

As shown in Figure 2, the analysis of studies before 2006 showed that in the conceptualization and Terminology of workplace loneliness in the years before 2006, the word "alienation" with 36 occurrences and 163 connections with other keywords was the most common keyword used in the studies.

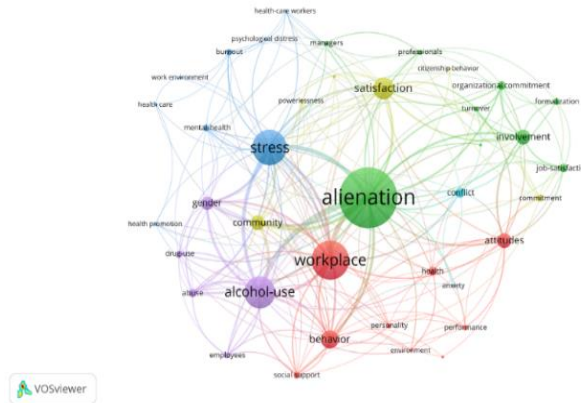


Figure 2. Network Visualisation Map of Author Keywords before 2006

In addition, several keywords were used in the conceptualization of loneliness in the workplace during the period of interest, for example, "workplace" (23 references), "stress" (21 references), "alcohol use" (19 references), "Satisfaction" (13 references), "Behavior" (11 references), "Community" (9 references), "involvement" (9 references). In addition, the concept of alienation is related to several other keywords such as formalization, job satisfaction, leadership, organizational commitment, professionals, and turnover.

In the examination of the network visualization map of keywords co-occurrence for the years 2006-2015, as can be seen in Figure 3, the analysis showed that in conceptualization and Terminology of workplace loneliness, the word "*ostracism*" with 19 occurrences and 116 connections with other keywords was the most common keyword used in the studies. In addition, several keywords were used in the conceptualization of loneliness in the workplace during the period, for example, "alienation" (23 references), "exclusion" (17 references), "workplace" (15 references), "Performance" (10 references), "Rejection" (10 references) and "Job Satisfaction" (10 references). In addition, the concept of ostracism was related to several other keywords such as conflict, job satisfaction, leader-member exchange, organizational citizenship behavior, perceived organizational support, and social influence. In this analysis, 73 keywords (with at least 2 references) were examined.

process of loneliness in the workplace. The noteworthy point is related to the statistics of the studies of 2022, which until the time of conducting this study includes about 350 studies (about 15%), which will naturally increase until the end of 2022. The field of loneliness in the workplace has grown significantly since 2006, especially in the past few years, which has greatly influenced the literature. Also, considering the current social conditions and crises, especially Corona, loneliness in the workplace is a topic that has recently developed and is currently of great importance to industry and academia.

Regarding the second research question, statistics and figures showed that although the concept of loneliness is rooted in psychology, the largest number of published articles on loneliness in the workplace is in the field of management, and fortunately, scientific attention from management researchers is promising. Due to the breadth of this subject area, every day it interacts more with other sciences (medical sciences and nursing, psychology, political sciences, Social and human science, History and Philosophy of Science, etc.). In other words, it has extensive interdisciplinary relationships.

Countries such as the United States, China, England, Netherlands, Canada, Germany, Australia, Sweden, and Spain are among the countries that contribute the most to studies of loneliness in the workplace. Studies have been conducted mainly in the developed and western countries of the world. Asian countries such as China are also making efforts to add to the collection of knowledge. The findings of this section answer the third question of the research.

The fourth question of the research is looking for the authors with the largest share of scientific publications. The results indicate that Williams, kd; Ferris, dl; Baumeister, rf; Cacioppo, jt; Podsakoff, pm; Hobfoll, se; Holt-lunstad, j; and Seeman, m had the highest number of references to the author. After identifying the mentioned authors, those interested in this field can create opportunities for cooperation with them in the future or refer to the articles of the mentioned authors in their future research. The fifth question of the research is looking for the evolutionary process of loneliness studies in the workplace based on the topic. To find the roots and search for a more suitable word for and to better examine the evolutionary process of the field of loneliness in the workplace, network visualization has been used

in 3 periods before 2006, 2006-2015 and after 2016. Since new studies about loneliness in the workplace have been seriously conducted since 2006 by Sarah Wright, therefore, the 2006 period has been chosen as the basis. The analysis of network visualization of the keywords co-occurrence showed that the three concepts of alienation, ostracism, and loneliness have led to the evolution of this field over time. Figure 6 summarizes the evolution of studies of loneliness in the workplace by topic.

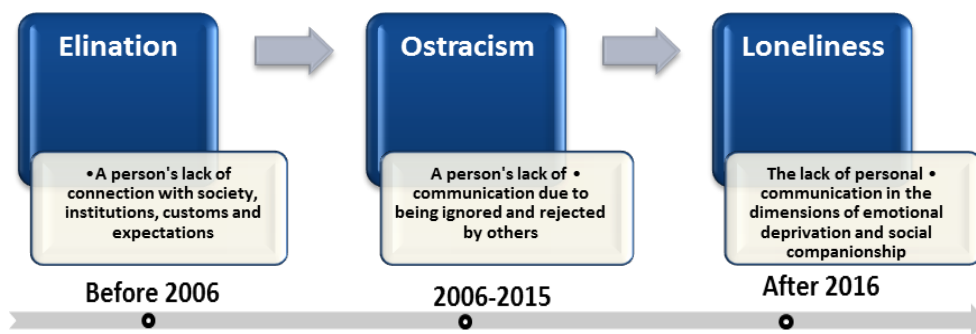


Figure 6. Knowledge map and evolutionary process of studies of loneliness in the workplace based on the topic

The results of this research showed that by examining the studies in the field of loneliness in the workplace until 2006, the word alienation appeared the most effective concept. According to Banai et al. (2004) alienation from work means that the work situation fails to meet the employee's needs. Alienation is the disparity in employee and work mentality caused by disagreements. They define alienation as "a state of psychological disconnection from work in which work lacks the potential to meet a person's critical needs and expectations."

By definition, what alienation and loneliness have in common is that they are subjective experiences and involve negative emotions, and alienated people and lonely people both share the assumption that there is a difference between them and the rest of society. Here are the differences:

First, the object reflects the alienation of work, and how employees perceive their relationship to work, while the loneliness aspect of the

workplace reflects the employee's relationship to other organizational members. It reflects employee perceptions. Second, in terms of content, alienation from work is broader, including powerlessness, self-estrangement, normlessness, isolation and meaninglessness, and loneliness focused solely on relationship problems at work (Zhou, 2018). In other words, the difference between loneliness and alienation is the lack of connection. Loneliness is related to a person's relationship with others, and alienation is related to a person's relationship with society, its institutions, customs, or expectations. Lonely people have difficulty in fulfilling the need for communication (Brennan, 1975).

In the survey of the visualization map of the network of loneliness in the workplace in 2006-2015, the word ostracism appeared. Ostracism is the state of being left out and ignored (Williams and Zadro, 2013). When compared to loneliness, the deeper trauma of ostracism takes longer to heal (Wesselman et al., 2012). While loneliness and ostracism are related concepts, it is important to understand the differences between them and how the two conditions interact. Ostracism is defined as "being ignored or rejected" by others (Williams and Zadro, 2013). While loneliness is caused by perceived social exclusion, ostracism involves the intentional and overt social rejection of an individual by a group of individuals. Unlike loneliness, which is a long-term state of mind that gradually develops in a person, ostracism can be immediately imposed on another by an external source (Lawrence, 2018). Ostracism and loneliness attract attention as two topics that are often confused with each other in literature. Loneliness is only one possible consequence of ostracism. On the other hand, ostracism is not a necessary component of loneliness. Various factors can cause loneliness in the workplace. In general, these factors seem to be classified as individual, situational, cultural, or organizational factors (Uslu, 2021).

In recent years, the word loneliness in the workplace has been recognized as a dominant and popular concept by researchers. The results showed that loneliness in the workplace during the coronavirus plays a key role as a hot topic and research gap. This is in line with the Gallup (2020) survey, the results of which showed that with the spread of Corona around the world, the world of work evolved rapidly. In the United States and around the world, the vast majority of jobs became telecommuting. This unanticipated and forced shift to remote work created unprecedented challenges for

organizations and their employees. For example, recent studies show that pervasive feelings of loneliness, anxiety, and reduced well-being, which already affect many employees with traditional work arrangements (Becker et al., 2021), were amplified during the first few months of the corona.

Future Research Agenda

According to the density visualization of keywords co-occurrence (Figure 5), suggestions for future researchers can be categorized into four thematic groups; Suggestions related to individual, group, organizational, and ultra-organizational-level issues. Figure 7 shows a future research map categorized by level.

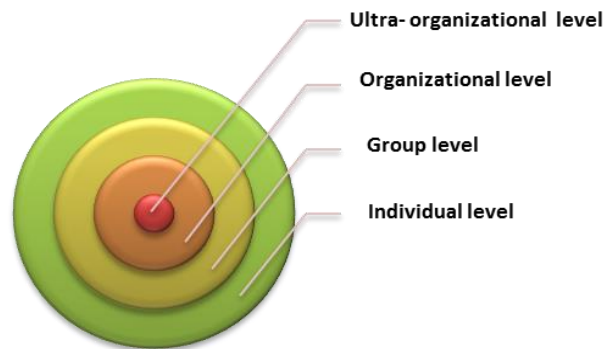


Figure 7: Future research map categorized by level

Since loneliness in the workplace is intended for "employees" or in other words "individuals", the title "individual level" has been considered for it. Group-level issues are proposed to identify vulnerable groups in terms of age, gender, education level, marital status, and the position of people in the organizational hierarchy. Organizational-level topics include proposals that are somehow related to organizational variables or examine the relationship between phenomena affecting organizational processes and factors and loneliness in the workplace. Ultra-organizational issues include proposals that are beyond the control of the organization and the individual and have an Ultra-organizational and macro-environmental nature. In the following, each of the proposals will be examined.

- **Suggestions for future research at the individual level**

1. *Explanation and conceptualization of loneliness in the workplace:* Based on the evolutionary process of studies of loneliness in the workplace based on the subject (Figure 6), since in recent studies, special attention to the concept of "loneliness" has been carried out and the review of internal studies also indicates the lack of researchers' focus on this field, therefore, it is suggested that future researchers analyze and explain the concept of loneliness in the workplace.
2. *Identifying strategies to deal with loneliness in the workplace:* Identifying strategies to deal with loneliness in the workplace to reduce its negative effects on employees. Therefore, it is suggested to identify solutions and strategies to deal with loneliness in the workplace in future research.
3. *Antecedents and consequences of loneliness in the workplace:* Based on the density visualization map (Figure 5), some keywords such as resilience, meaningful work, creativity, self-belief, deviant behaviors, enthusiasm, conflict and attitude, depression, and discrimination are the most common. Since it seems that some of these words are antecedents of loneliness in the workplace and some others are its consequences, it is suggested to identify and rank the antecedents and consequences of workplace loneliness in future research.

- **Suggestions for future research at the group level**

4. *The role of demographic variables in workplace loneliness:* The results of the density visualization map (Figure 5) showed that the keywords of age, and gender are topics that have not been investigated about loneliness in the workplace. There is a gap for those interested in investigating the role of demographic variables such as age, gender, education, and marital status in future studies on loneliness in the workplace.
5. *The effect of the position of people in the organizational hierarchy on loneliness in the workplace:* As can be seen in the density visualization map (Figure 5), the keywords leadership and power distance have a co-occurrence with loneliness in the workplace. Researchers can answer the question of whether managers or employees are lonelier, conduct research with a qualitative approach, and provide a model for workplace loneliness of managers.

- **Suggestions for future research at the organizational level**

6. *The role of the Internet, information technology, and digital organizations in loneliness in the workplace:* The results of the density visualization map (Figure 5) showed that the keywords of Internet addiction, use of the Internet and technology have also occurred with loneliness in the workplace, but still It has not turned into red color spots. This means that research topics can be defined in these areas. Considering the rapid advancements of technology and technology, future researchers are suggested to use the phenomenological method to analyze the lived experience of lonely employees facing the digital workplace.
7. *The role of leadership style in loneliness in the workplace:* The keywords of leadership, authoritarian leadership, and the leader-member exchange in the density visualization map (Figure 5) coincide with the keywords of loneliness and ostracism, and are placed in the areas that can be research opportunities. Investigating the impact of leadership styles on loneliness in the workplace or organizational ostracism can be a subject for future research.

- **Suggestions for future research at the ultra-organizational level**

8. *The role of social, economic, cultural, and technological developments on loneliness in the workplace:* Based on the evolutionary process of studies of loneliness in the workplace based on the topic (Figure6), investigating reasons and purposes behind the rise of each of the concepts alienation, ostracism and loneliness in The length of history given developments and environmental changes is recommended to those interested. By studying how the workplace is affected by social, economic, cultural, and technological transformations and developments, researchers can achieve a deeper understanding and knowledge about each of the concepts of alienation, ostracism, and loneliness.
9. *Loneliness in the workplace during the Corona era and after:* Based on the results of the density visualization map (Figure 5), since the keyword "corona" is one of the concepts that have many co-occurrences with "loneliness", therefore future researchers are suggested to investigate the changes in organizations in the era of Covid-19 and its impact on loneliness in the workplace.

10. *Cross-cultural studies on loneliness in the workplace:* One of the findings of this research is the identification of the countries that contribute the most to studies of loneliness in the workplace. The countries of America, China, England, Holland, Canada, Germany, Australia, Sweden, and Spain, which are among the developed countries, were identified. Investigating the situation of loneliness in the workplace in underdeveloped and developing countries has been neglected. Conducting cross-cultural studies to identify the causes of possible heterogeneity in the results of research on loneliness in the workplace in developing and developed countries is recommended to those interested in this field.

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