Systematic Review

Teleworking and Mental Well-Being: A Systematic Review on Health Effects and Preventive Measures

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Abstract: Background: In the aftermath of the Coronavirus pandemic and the resulting lockdown and social distancing policies, a new form of work, already existing in the past, has been further enlarged. Teleworking is "full- or part-time electronic work, on-line or off-line, performed at home by self-employed or office workers" and today represents an important lever for companies, including for sustainability, allowing employees to work flexibly, efficiently and remotely. The relationship between telework and sustainability in economic, social, and environmental aspects is also being questioned. The aim of this systematic review is to investigate the effects this has had on workers' mental health. Methods: PRISMA guidelines were followed. The research was performed on Pubmed and Scopus without restrictions on study type and time limits. The methodological quality of the studies included was assessed using AMSTAR-2, INSA and NOS scales. A meta-analysis of the main adverse effects found in observational studies was also carried out. Results: A total of 38 articles were included in the systematic review. A large proportion of the studies examined showed a correlation between teleworking and worsening mental health. The meta-analysis showed increased levels of mental ill-health (38.8%), stress (28.4%), isolation (6.3%), anxiety (23%), depression (22.6%), work–family conflicts (19.5%), poor sleep quality (56.4%), fatigue (16.1%) and irritability (39.6%). Conclusions: Although most of the works analyzed show a deterioration in the mental health of workers, positive effects were noted in some. There is the need for more studies to optimally investigate the cause–effect relationship between teleworking and mental health deterioration.

Keywords: teleworking; mental health; stress; occupational health; prevention

1. Introduction

Since the end of the last century, thanks to technological progress, some companies have offered their employees, with the aim of reducing costs, the opportunity to work from home.

The term most widely used in Italy to refer to teleworking is 'smart working', which can be translated as 'agile working'. This was, before the Coronavirus pandemic, a sporadic and unpopular phenomenon in Italy compared to other parts of Europe, especially Scandinavia, the Netherlands, and France, and this may be due to several factors: poor dissemination of information and communication technologies (ICT), low ICT skills, internet connectivity, and a different work culture [1].

Studies have already been carried out in the past; as described by Mann [2] and Montreuil [3] in 2003, teleworking has led to several benefits, but also brings problems: certainly, teleworkers enjoy more free time, not having to travel to the office every day, reduced expenses, greater flexibility and, in some cases, increased productivity. On the other hand, the main problems faced by teleworkers are social isolation and loneliness, presentism (i.e., working longer than one should or when one is ill), lack of support and reduced possibilities for career advancement. All these problems can have a negative impact on workers' mental health.

During the 2020s, the world was faced with a series of problems, triggered by the spread of a new Coronavirus, SARS-CoV-2, responsible for COVID-19 disease. This disease manifested itself in most people as a flu-like syndrome, but became more dangerous in the elderly and immunocompromised, presenting respiratory difficulties with interstitial pneumonias that strained hospital facilities in all countries, even the most advanced.

To mitigate the spread of the virus, governments in most countries implemented policies to lock down the entire population except for essential workers. Productive activities therefore had to cope with the need to survive and, at the same time, comply with government instructions. These conditions led to the implementation of teleworking, a new form of work, already existing in the past, which has been further enlarged, spreading considerably throughout the world. "Teleworking is full- or part-time electronic work, on-line or off-line, performed at home by self-employed or office workers" [4].

Teleworking today constitutes an important lever for companies, including its relationship to sustainability. In fact, smart working is designed to ensure both business continuity and productivity: it allows employees to work flexibly, efficiently and remotely, reducing the need for commuting and sometimes even eliminating it altogether. On the one hand, it improves productivity; on the other, it reduces the burden on the environment: less commuting means fewer emissions, especially if people commute by car. In this way, rush-hour traffic is also reduced, preventing further fuel waste in slow-moving traffic.

The relationship between telework and sustainability in economic, social, and environmental aspects is also being questioned due to the shift to remote work during the global health emergency. This shift has led to a reevaluation of the role of individuals in society, production mechanisms, and community networks. Workers have experienced newfound autonomy, responsibility, and well-being in their work activities, allowing for a better balance between work and personal life. Additionally, this flexibility in work structures can meet the care needs of individuals with disabilities or special health conditions, benefiting both workers and their families.

However, teleworking can have negative consequences for employees' mental health, such as loss of sociability, overworking, and difficulties in disconnecting from the requirements of the job. Inadequate workstations and an excessive care burden on women workers also emerged during the lockdown phase [1,5].

Mental health is 'a state of mental well-being that enables people to cope with the stresses of life, to realize their abilities, to learn well and work well, and to contribute to their community. It is an integral component of health and well-being that supports our individual and collective capacities to make decisions, build relationships and shape the world in which we live. Mental health is a "fundamental human right and it is fundamental to personal, community and socio-economic development" [6].

According to Montreuil [3], one of the first to take an interest in this subject, "Mental health is the ability of an individual to adapt to his or her environment. In the specific case of teleworking, it involves accepting a certain degree of isolation in terms of work and colleagues, as well as a certain uncertainty, since supervision is provided in a different way".

The aim of this review is to gather all the information from the scientific studies concerning the effects of teleworking on the psychological distress and perceived well-being of workers and to investigate the preventive measures put in place to reduce its negative effects. This research reports on the unique challenges and advantages identified in remote working.

2. Materials and Methods

The presentation of this systematic review is in accordance with the PRISMA guidelines statement (see Supplementary Materials).

2.1. Literature Research

The review includes articles published on two online databases, PubMed and Scopus, until February 2023. The search strings used were "(Telework AND health) OR (Telework AND mental) OR (Telework AND prevention) OR (Telework AND stress) OR (Telecommuting AND health) OR (Telecommuting AND mental) OR (Telecommuting AND prevention) OR (Telecommuting AND stress)" and these are collected in Table 1. The articles included in the systematic review are selected considering the predetermined inclusion and exclusion criteria.

The selection is carried out by two independent reviewers by first reading the titles and abstracts of the articles identified by the search strategy. Relevant reports are selected according to inclusion and exclusion criteria. Finally, the compatible full texts are independently assessed for definitive eligibility.

Table 1. Search strings.

Telework AND health
Telework AND mental
Telework AND prevention
Telework AND stress
Telecommuting AND health
Telecommuting AND mental
Telecommuting AND prevention
Telecommuting AND stress

2.2. Inclusion Criteria

Only articles entirely in English are included in the review, focusing on mental health and stress associated with teleworking, as well as preventive measures to improve workers' conditions. Furthermore the selection was limited to narrative and systematic reviews (with or without meta-analysis), cohort, cross-sectional and case-control studies.

2.3. Exclusion Criteria

We excluded from the review articles that do not focus on teleworking and its effects on the mental health of workers, as well as purely descriptive articles, journal articles, letters to editors, conferences paper and speeches at scientific conferences. Articles not entirely in English are also excluded.

2.4. Data Extraction and Quality Assessment

The following characteristics were collected: first author, study design (cross-sectional, cohort, case-control, RCT, meta-analysis, systematic review), year of publication, country of the first author, and quality score. Two different reviewers assessed the methodological quality of the selected studies with specific rating tools:

1. INSA scales (International Narrative Systematic Assessment) [7] to judge the quality of narrative reviews;
2. AMSTAR-2 scales (A MeaSurement Tool to Assess systematic Reviews 2) [8] for systematic reviews with no meta-analysis;
3. NOS (Newcastle–Ottawa scale) [9] for cohort and case-control studies, while a modified version of the NOS is used for cross-sectional studies [10]. For the modified version, these parameters are taken into consideration: the selection, i.e., the size and representativeness of the sample; the validity of the measuring instruments; the comparability of the different groups analyzed; and the outcome, together with the statistical analysis of the results obtained. The maximum score is 10.

2.5. Statistical Analysis

Meta-analyses were carried out using the statistical software SPSS version 27 for the pooled analysis of unadjusted and added RRs, respectively. Forest diagrams were realized to explain the results of the individual studies and meta-analyses. Cochran's Q-test was utilized to assess heterogeneity, followed by the calculation of I2 (percentage of the effect size attributable to heterogeneity). Effect size heterogeneity was found to be significant for *p*-values < 0.10 or I2 > 0.20. The pooled RR and the corresponding 95% Confidence Interval (95% CI) were calculated.

3. Results

The online search returned 3163 references on the following databases: PubMed (1528), and Scopus (1635). A total of 1996 duplicated references and 20 references without the author's name were excluded.

In addition, 1074 references are excluded because they are unrelated to the topics of interest. Of the remaining 73, 33 references do not meet the inclusion criteria (Figure 1).
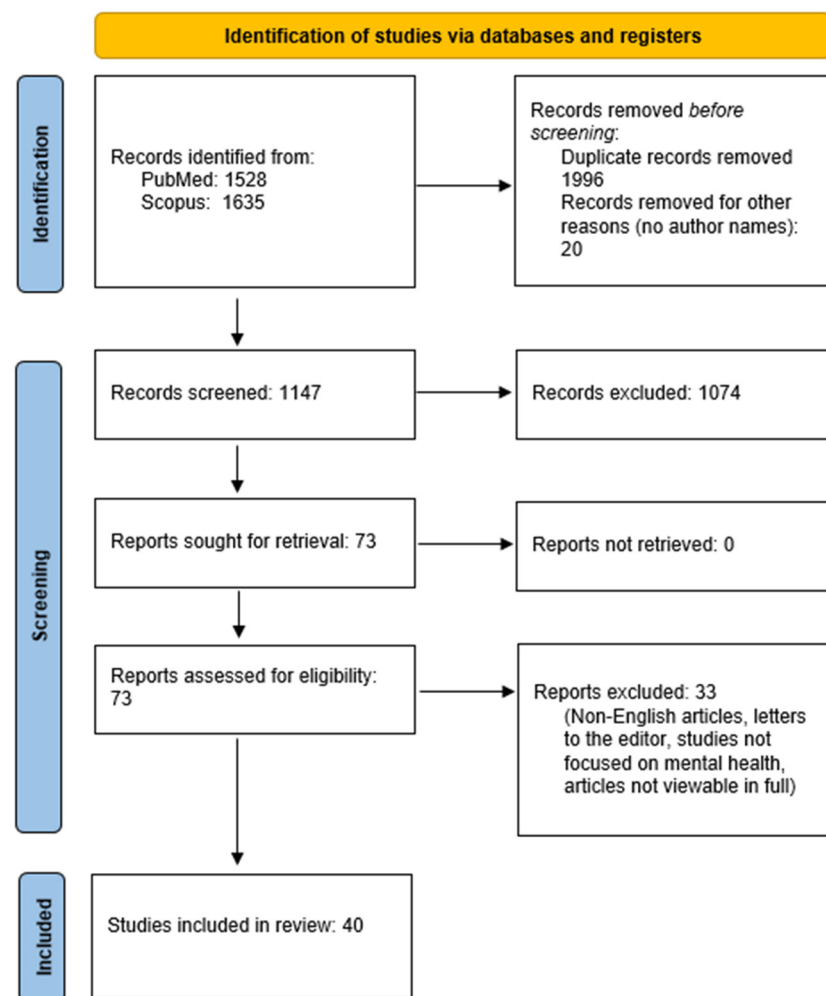

Figure 1. PRISMA flow diagram.

Ultimately, 40 studies are included in this review (Table 2).

They consist of 8 narrative reviews (average INSA score of 6), 7 systematic reviews (average AMSTAR-2 score of 8) and 25 original articles (22 articles with an average NEW-CASTLE OTTAWA SCALE score of 7, 1 article with a JADAD score of 4, 1 article with not applicable scoring). Among the original articles, 2 are before-and-after studies, 6 are case-control studies, 11 are cohort studies, 4 are cross-sectional studies and 4 are other

kinds of study. The study by Lemaire and Wallace is not assessed for quality because the Newcastle–Ottawa Scale is not applicable. WRS risk factors and preventive measures are grouped together to summarize the results (Tables 3 and 4).

The 2 longitudinal studies were evaluated with the Newcastle–Ottawa scale and both reported a score of N6 [9].

There are 30 cross-sectional studies with an average score of 6.9 for quality assessment, for which a version of the modified NOS [10] is used and adapted to the characteristics of the cross-sectional study: in this version, the quality of the sample and the statistical analysis of the survey results are assessed whereas, with the standard NOS [9], which remains very valid for assessing cohort studies and longitudinal studies, the selection of exposed and unexposed cohorts and the goodness of follow-up are taken into account, features that can be assessed little or not at all in a cross-sectional study.

There are 3 narrative review studies, with an average score of 6 on the INSA scale [7].

There are 6 systematic review studies with an average score of 8 on the AMSTAR-2 scale [8].

Table 2. Studies included in the review.

Authors	Type of Study	Country	Year	Score
Mann et al. [2]	Cross-sectional Study	UK	2003	N3
Hartig et al. [11]	Cross-sectional Study	Sweden	2007	N5
Henke et al. [12]	Longitudinal Study	USA	2016	N7
Oakman et al. [13]	Systematic Review	Australia	2020	A9
Mheidly et al. [14]	Narrative Review	Lebanon	2020	I6
Song et al. [15]	Cross-sectional Study	USA	2020	N8
Kotera et al. [16]	Systematic Review	UK	2020	A10
De Sio et al. [1]	Cross-sectional Study	Italy	2021	N8
Xiao et al. [17]	Cross-sectional Study	USA	2021	N8
Pelissier et al. [18]	Cross-sectional Study	France	2021	N8
Niu et al. [19]	Cross-sectional Study	Japan	2021	N7
Galanti et al. [20]	Cross-sectional Study	Italy	2021	N6
Liu et al. [21]	Systematic Review	China	2021	A5
Estrada-Munoz et al. [22]	Cross-sectional Study	Chile	2021	N7
Şentürk et al. [23]	Cross-sectional Study	Turkey	2021	N8
Escudero-Castillo et al. [24]	Cross-sectional Study	Spain	2021	N8
Parent-Lamarche et al. [25]	Cross-sectional Study	Canada	2021	N7
Wöhrmann et al. [26]	Cross-sectional Study	Germany	2021	N7
Sutarto et al. [27]	Cross-sectional Study	Indonesia	2021	N8
Sandoval-Reyes et al. [28]	Cross-sectional Study	Colombia	2021	N7
Heiden et al. [29]	Cross-sectional Study	Sweden	2021	N6
Afonso et al. [30]	Cross-sectional Study	Portugal	2021	N6
Beckel et al. [31]	Narrative Review	USA	2022	I7
Zalat et al. [32]	Cross-sectional Study	Egypt	2022	N6
Lunde et al. [33]	Systematic Review	Norway	2022	A9
Schall et al. [34]	Narrative Review	USA	2022	I5
Somasundram et al. [35]	Longitudinal Study	Canada	2022	N5
Niebuhr et al. [36]	Cross-sectional Study	Germany	2022	N6
Serrão et al. [37]	Cross-sectional Study	Portugal	2022	N6
Costa et al. [38]	Cross-sectional Study	Italy	2022	N6
Miyake et al. [39]	Cross-sectional Study	Japan	2022	N9
Michinov et al. [40]	Cross-sectional Study	France	2022	N7
Ikegami et al. [41]	Cross-sectional Study	Japan	2022	N8
Furuya et al. [42]	Systematic Review	Japan	2022	A6
Bodner et al. [43]	Cross-sectional Study	Canada	2022	N7
Raišiene et al. [44]	Cross-sectional Study	Lithuania	2022	N6
Wontorczyk et al. [5]	Cross-sectional Study	Poland	2022	N7
Mendonça et al. [45]	Cross-sectional Study	Portugal	2022	N8
Antunes et al. [46]	Systematic Review	Brazil	2023	A8
Kim et al. [47]	Cross-sectional Study	Korea	2023	N7

N = Newcastle–Ottawa scale; I = Insa scale; A = Amstar2 scale.

Table 3. Effects of teleworking and attendance rates in studies.

Effects of Teleworking (Presence in Articles)	%
Stress	47
Anxiety	27
Depression	23
Isolation	27
Mental well-being	13
Family-work conflict	13
Fatigue	10
Work-life balance	10

Table 4. Prevention measures and attendance rates in studies.

Main Preventive Measures (Presence in Articles)	%
Psychological support	15
Increased flexibility (office–teleworking alternation)	12
Best communication	9
Increased frequency of breaks	6

3.1. Narrative Revision Studies

In the study by Mheidly et al. [14], the results of the narrative review show an increased level of stress and anxiety in those who use smart devices for work. This is one of the few studies in which various strategies are proposed to reduce the risk of psychological stress and to preserve the mental health of workers, for example, greater interest from and participation by the media in raising awareness of the risks of telecommuting isolation; increasing the frequency of breaks during teleconferences.

In the work of Schall et al. [34] also, emphasis is placed on the evidence-based strategies best suited to improve the job security, health and well-being of teleworkers, as well as on the main factors that adversely affect them, such as limited interaction with colleagues and supervisors, inadequate ergonomic support and training, and the uncertainty of the boundary between work and non-work.

The work of Beckel et al. [31] reports the highest score (I7) in the quality assessment. This study provides a comprehensive review considering the individual differences of teleworkers and follows through to the development of an original conceptual model capable of ensuring a thorough and comprehensive analysis of the various 'outcomes' associated with teleworking (mental health, stress, anxiety, burnout).

3.2. Systematic Reviews

Even though the work of Oakman et al. [13] is a 'rapid review', a systematic procedure for searching and selecting articles is carried out. The studies reviewed suggest a considerable impact of teleworking on workers' well-being; however, the number of studies on the subject was still small in 2020.

The Chinese study by Liu et al. [21] and the Japanese study by Furuya et al. [42] show how negative rather than positive impacts on telecommuters are described in most of the articles reviewed; the latter also acknowledges some influence of workers' social and individual circumstances.

The two best studies are by Kotera et al. [16] and by Lunde et al. [33], scoring A10 and A9 on the AMSTAR-2 scale, respectively. The first study [16] highlights the positive and negative aspects that emerged from the review: among the positive aspects was greater work engagement and connectivity among staff; among the negative aspects were the uncertain boundary between work and home, fatigue and stress; finally, the authors complain of a low number of experimental studies, no randomized trials and a medium to high risk of bias. The second study [33] identifies several outcomes of interest (stress, burnout, general health, satisfaction, pain), but articles with low risk of bias present mixed results.

Finally, the study by Evelise Dias Antunes et al. [46] investigates the difference between full-time and part-time teleworkers, highlighting how the former are at greater risk of encountering mental health problems, whereas part-time teleworking may bring benefits in terms of better balancing of social and working life, better communication and social relations

All the papers analyzed agree that more research is needed in this area, considering the strong impact that the Coronavirus pandemic has had on the world of work. They also support the need to implement prevention strategies that can improve the general health of teleworkers.

3.3. Longitudinal Studies

The two studies by Henke et al. [12] and Somasundram et al. [35] are the only ones to assess trends in the perceived mental health of telecommuters over a given period (follow-up). The study by Somasundram et al. [35] finds a reduction in stress and burnout, while that of Henke et al. [12] finds an association between teleworking and depression, but not between teleworking and stress: teleworkers appear to suffer less from depression than non-teleworkers.

The limitation of these studies, as well as the cross-sectional studies that will be described later, is that we cannot know whether there is a causal relationship between the exposure (telecommuting) and the outcome (improvement or worsening of mental health), but must rely on the respondent's feelings. In addition, in the first study [12] there is poor sample representativeness; in the second study [35], there is a low follow-up response rate (less than 25%).

3.4. Cross-Sectional Studies

The study with the highest score (N9) is that of Miyake et al. [39], which focuses on the relationship between work-related stress and loneliness in teleworkers and non-teleworkers; the results show that there is an association between stress and loneliness, but not between loneliness and teleworking, although those who work from home more frequently tend to feel lonely. In contrast, the lack of support from colleagues and supervisors is strongly associated with the feeling of isolation felt by the teleworker.

The studies that report a lower score have problems in the selection of the sample: the sample could be either not very large, not representative, with no comparison between 'responders' and 'non-responders', or make use of unvalidated, albeit accurately described, measurement instruments.

One article dates back to the pre-COVID-19 era, that of Hartig et al. [11] from 2007, in which the spatial, temporal and mental overlap felt by teleworkers and the consequent difficulty in reconciling work and living environments is described, although statistical analyses in favor of this association are not significant enough.

There are two American studies, both scoring N8: the first by Song et al. [15], which shows discrepancies in the results obtained according to the family status and gender of the people interviewed, with reduced happiness and increased stress levels on weekday workdays and increased general well-being in couples with children who work on weekends, while women without children also experience more stress on work weekends; the second by Xiao et al. [17], which shows that the reduced mental well-being of telecommuters can be attributed to reduced physical well-being, due to lockdown policies and increased sedentariness. Women, especially mothers, are at greater risk of increased stress due to lack of support with school-age children.

Three Italian articles are included in the review: the study by De Sio et al. [1] received the highest score (N8) and draws attention to harmful habits caused by increased stress, such as smoking and pursuing an unhealthy diet, especially in those who live alone and have a high level of education; the study by Galanti et al. [20] reports how social isolation and work–family conflict are factors that reduce productivity and increase stress; the study by Costa et al. [38] shows that increased irritability, loneliness and stress are associated with poor sleep quality experienced by those who work from home, although fear of infection and uncertainty about the future may have had a negative influence on those surveyed.

Several studies received an excellent quality rating, with a score of N8.

The study by Pelissier et al. [18] analyses the conditions of teleworkers in a hospital environment and finds an association between anxiety disorders and increased stress due to the difficult work–family balance.

The study by Minji Kim et al. [47], which involved 28,633 participants in South Korea, evaluates the differences between teleworkers and non-teleworkers regarding the perception of anxiety symptoms and sleep disorders: the results show a higher prevalence of these symptoms in teleworkers, especially in women.

The study by Ikegami et al. [41] focuses on the perception of work-related stress among those who work in the office and those who work from home with low, medium and high frequency; the latter are found to be less affected by increased stress than the other groups, and indeed 10% of them report decreased stress levels.

The study by Şentürk et al. [23] identifies the main factors associated with increased stress, anxiety and depression, namely poor sleep quality, concentration problems at work and being a woman.

The difficulties of women struggling with working from home are highlighted in two other N8-rated studies: the Spanish study by Escudero-Castillo et al. [24] finds a greater lack of mental well-being in women living alone or with children than in men; the Indonesian study by Sutarto et al. [27] identifies higher levels of anxiety and stress in women, young people, unmarried people and those without children, data that seem to run counter to the general perception that sees life as a couple and the presence of children as potentially stressful elements.

The study by Mendonça et al. [45] demonstrated that teleworking is associated with communication overload leading to a sense of entrapment, which also correlates with feelings of anxiety, depression and stress; in general, women are more prone to anxiety and depression disorders than men.

The study by Estrada-Munoz et al. [22] describes increased levels of anxiety and fatigue in some Chilean teachers forced to work from home.

The study by Parent-Lamarche et al. [25] contrasts public and private sector workers, showing that the former benefited most from teleworking during the pandemic.

The study by Wöhrmann et al. [26] found indirect relationships between teleworking and the health of employees through the control of working time, being under pressure, working hours without boundaries, worsened relationships with colleagues, disturbances and interruptions.

The study of Heiden et al. [29] shows that perceived fatigue and stress increase with increasing teleworking hours, although the authors emphasize the impossibility of clearly establishing a cause–effect relationship.

The study of Sandoval-Reyes et [28] shows positive correlations between remote working and stress, and negative correlations between teleworking and work-life balance.

The study by Zalat et al. [32] demonstrated that stress and isolation are increased in teleworkers and that teleworking improves work–life balance.

The study by Niebuhr et al. [36] shows that more time spent working from home has a negative influence on stress-related symptoms.

The study by Afonso et al. [30] shows that increased levels of depression and anxiety are reported.

The study by Serrão et al. [37] focuses on the increased work-associated burnout felt by those working from home and the perception of increased levels of stress and depression.

The study by Michinov et al. [40] identifies two psychological profiles of teleworkers, one 'solitary' and another 'affiliative', and reports that the former experience a greater sense of stress and loneliness, and consequently less job satisfaction.

The study by Bodner et al. [43] demonstrated that teleworkers, always or a few times a week, report a better perception of their mental health.

The study by Raišienė et al. [44] focuses on the precarious work–family balance in those who work from home, especially in men, although women suffer a greater deterioration in mental health in general.

The study by Wontorczyk et al. [5] analyses the relationship between various stress-inducing job characteristics and work methodology (on-site, hybrid, remote). Teleworkers are found to be more in control of their work, while those working in the office have better relationships with their colleagues.

Finally, the study of Mann et al. [2] shows that teleworking has a significant emotional impact on employees, as reports of negative emotions, such as loneliness, irritation, worry and guilt are more pronounced, compared to office employees. Teleworkers in general experience more mental health problems than office workers.

It is quite understandable that the authors of the older studies found it difficult to involve an adequate number of teleworkers in their projects, given the enormous difference in the technological tools we now have at our disposal compared to the early 2000s. This results in an insufficient overall assessment.

The results from the analysis of the studies included in the systematic review are not unambiguous.

A summary of the main outcomes, i.e., the main negative effects associated with teleworking, is shown in Table 3, along with the percentage of original studies showing this correlation.

In most cases, an association is found between teleworking and a deterioration of workers' mental health: the main negative aspects are stress [1,15,17,18,20,22,23,27–29,32,36–38,40], anxiety [18,22,23,27,30,45,47], depression [23,30,37,45,46], work–family conflict [18,20,44,46,48], fatigue [22,29,32], indefinite work–social life boundary [11,28,44,46], isolation or loneliness [2,20,23,38,39]; in some works, on the contrary, positive aspects related to teleworking are found, such as better general well-being [25], less stress [35], less depression [12], and better work–social life balance [32,41].

It is worth noting that many authors point out substantial differences in the perception of women compared to men who telework; women are at greater risk of negative mental health effects [15,17,22–24,27,32,44,45,47].

As far as preventive measures are concerned, few studies make proposals in this regard, although almost all of them highlight their importance. Table 4 shows the most frequently found measures: increasing the frequency of breaks [14], more psychological support [13,14,34,42], better communication [31,39], and more flexibility [12,31].

3.5. Meta-Analysis

Table 5 shows the prevalence of the main adverse effects on the mental health of teleworkers in the various observational studies. Some of these do not report prevalence data, so it is not possible to include them in the meta-analysis.

Table 5. Prevalence of the main adverse effects on the mental health of teleworkers.

| Study	Number of Teleworkers	Psychological Discomfort (%)	Stress (%)	Anxiety (%)	Depression (%)	Work–Family Conflict (%)	Isolation (%)	Irritability (%)	Fatigue (%)	Poor Sleep Quality
Henke et al. [12]	2152		31.2		13.2					
De Sio et al. [1]	575	35.5	74.8				6.96			
Xiao et al. [17]	988	73.6								
Pelissier et al. [18]	340			31	7					
Niu et al. [19]	1810			36	36	15.3				
Estrada-Munoz et al. [22]	3006			11					7.2	
Şentürk et al. [23]	459		19.6	19.6	17.9		33.5			
Sutarto et al. [27]	472		86.9	64.6	81.6					
Zalat et al. [32]	413	45.5	65.9				22.8			51.1
Afonso et al. [30]	143			30.1	18.2					74
Costa et al. [38]	94						21.3	34		53.2
Miyake et al. [39]	4052						4.7			
Ikegami et al. [41]	4052		22.8							
Bodner et al. [43]	205	37								
Raišiene et al. [44]	475					36.1		40.7	72.4	

Report

This section presents the results of the meta-analysis for each factor identified within the systematic review, as reported in Table 6.

Table 6. Meta-analysis results.

	Psychological Discomfort (%)	Stress (%)	Anxiety (%)	Depression (%)	Work–Family Conflict (%)
Weighted average	38.786	28.436	22.993	22.590	19.467
Number of participants	3552	19,090	6316	7013	2371
Std. deviation	23.8039	14.3319	14.8394	17.6492	8.3270
	Isolation (%)		**Irritability (%)**	**Fatigue (%)**	**Poor Sleep Quality**
Weighted average	6.2694		39.593	16.097	56.442
Number of participants	15,009		569	3481	650
Std. deviation	5.81733		2.4903	22.3845	9.3600

The weighted average prevalences (pooled analysis) of the individual factors, considering the number of participants identified as teleworkers, are presented below (Figures 2–10).

The pooled prevalence of mental ill-health, considering four studies with a total of 3552 participants, is 38.8% (SD = 23.8%).
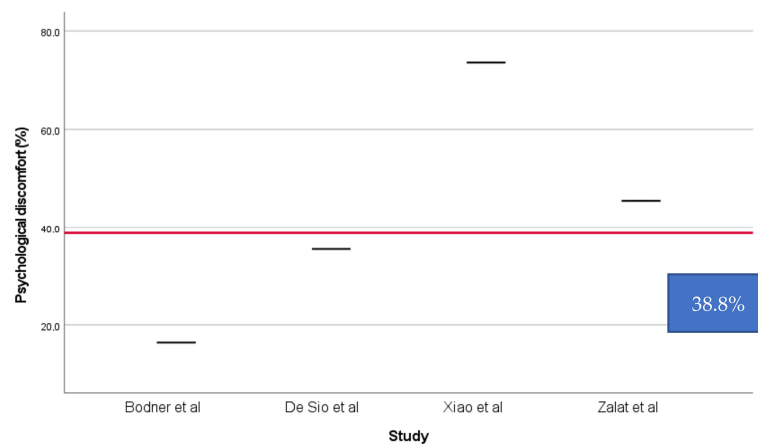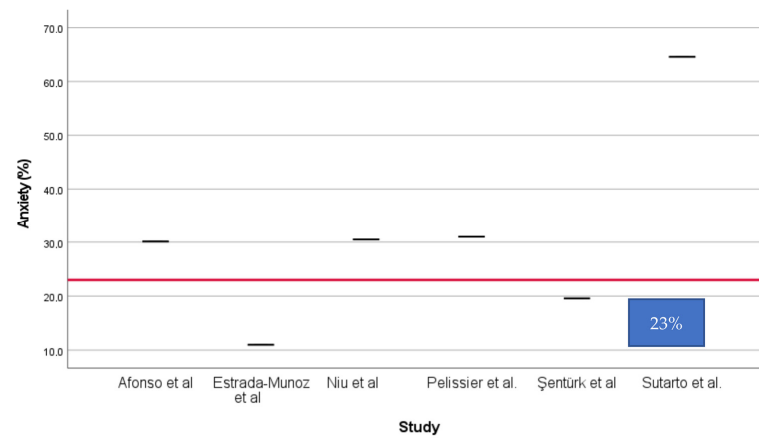

Figure 2. Psychological discomfort (%) [1,17,32,43].

The pooled prevalence of stress, resulting from the analysis of six studies with a total of 19,090 participants, is 28.4% (SD = 14.3%).
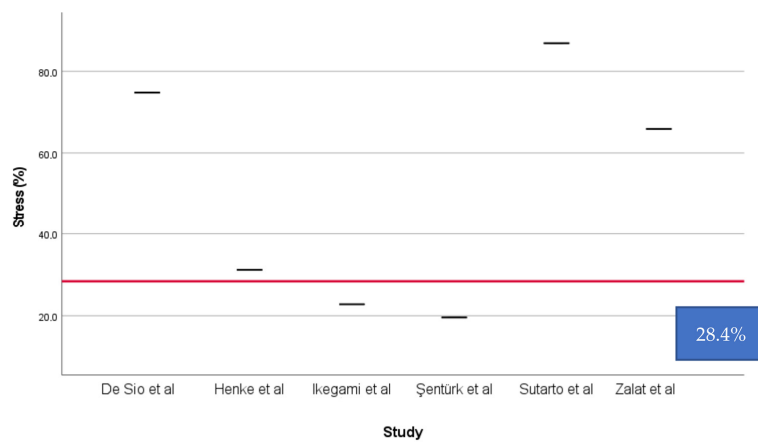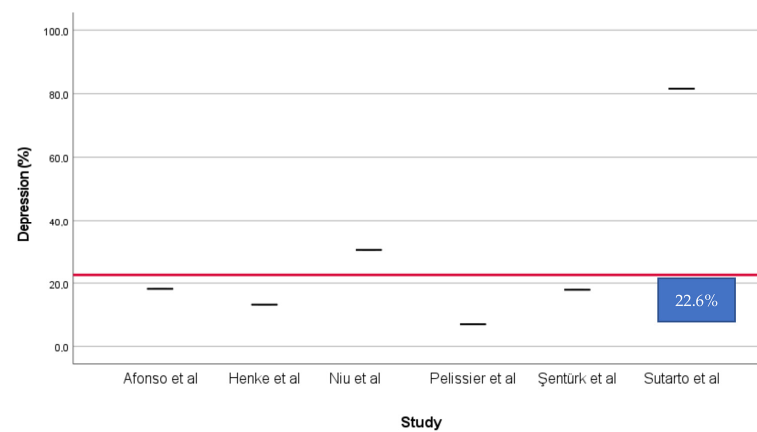

Figure 3. Stress (%) [1,12,23,27,32,41].

The pooled prevalence of anxiety, from the analysis of six studies with a total of 6316 participants, is 23% (SD = 14.8%).
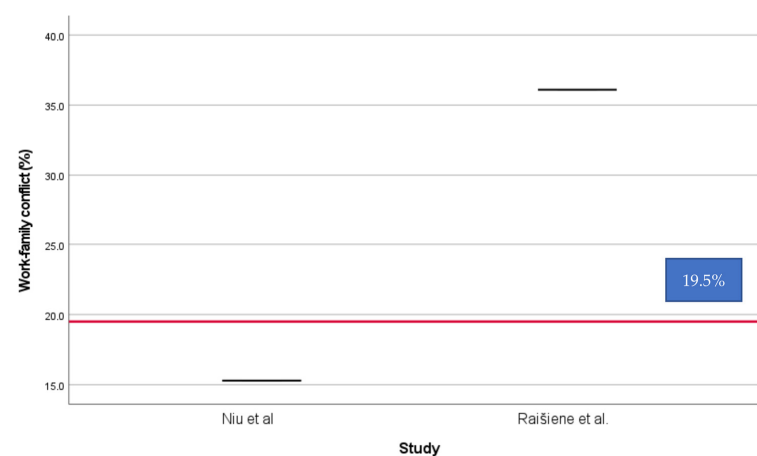

Figure 4. Anxiety (%) [18,19,22,23,27,30].

The pooled prevalence of depression, considering six studies with a total of 7013 participants, is 22.6% (SD = 17.6%).
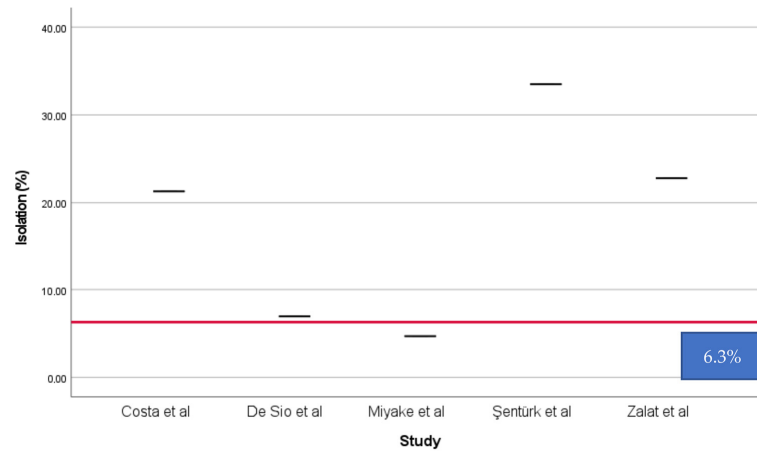

Figure 5. Depression (%) [12,18,19,23,27,30].

As far as work–family conflict is concerned, two studies are considered, with a total of 2371. The pooled prevalence is 19.5% (SD = 8.3%).
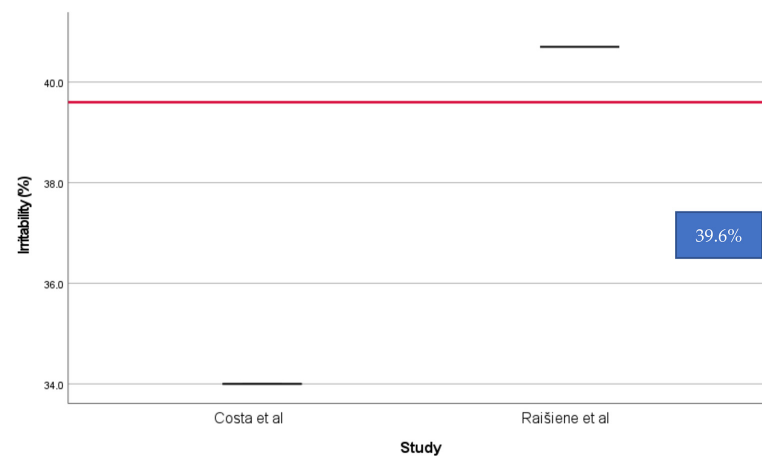

Figure 6. Work–family conflict (%) [19,44].

The pooled prevalence of isolation resulting from the analysis of five studies with a total of 15,009 participants is 6.3% (SD = 5.8%).
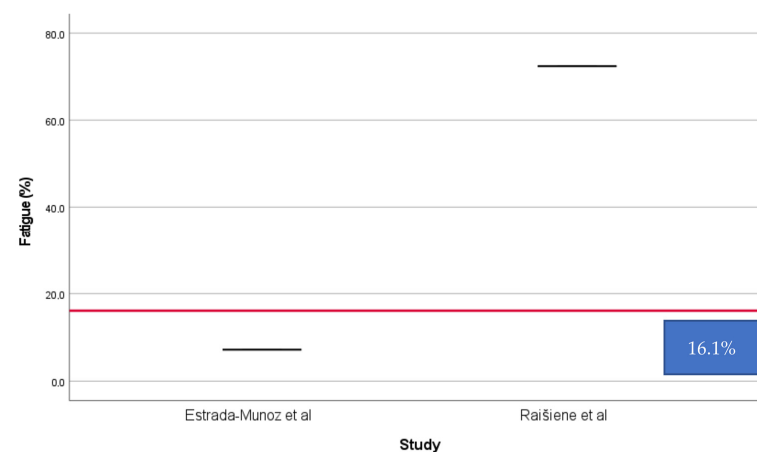

Figure 7. Isolation (%) [1,23,32,38,39].

The pooled prevalence of irritability, considering the two studies analyzed with a total of 569 participants, is 39.6% (SD = 2.5%).
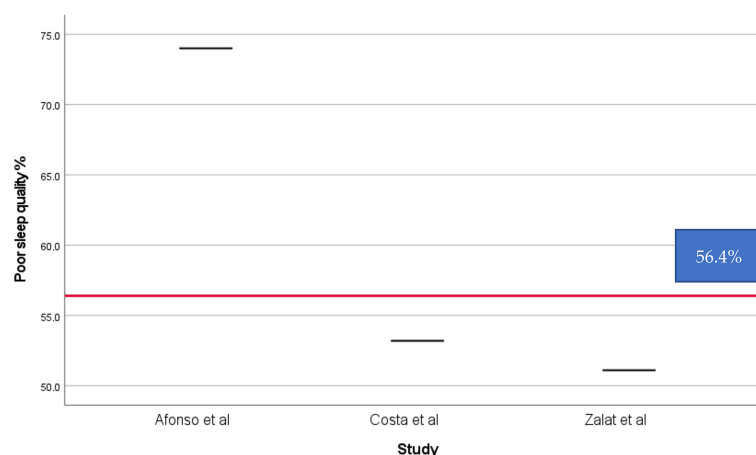

Figure 8. Irritability (%) [38,44].

The pooled prevalence of fatigue, derived from the analysis of two studies, with 3481 participants in total, is 16.1% (SD = 22.4%).

Figure 9. Fatigue (%) [22,44].

Finally, the pooled prevalence of poor sleep quality, considering three studies with a total of 650 participants, is 56.4% (SD = 9.4%).

Figure 10. Poor sleep quality [30,32,38].

4. Discussion

The aim of this study is to investigate, with a systematic review and meta-analysis, the effects of teleworking on the mental health of workers, with a look also at the preventive measures taken by companies or corporate figures who are responsible for protecting the health of workers, such as the occupational physician. Most of the studies examined show a correlation between teleworking and worsening mental health, and in particular substantial differences in the perception of women compared to men who telework; women are found to be at greater risk of adverse effects on mental health.

Most of these studies highlight negative health effects, such as: stress [1,15,17,18,20, 22,23,27–29,32,36–38,40], anxiety [18,22,23,27,30,45,47], depression [23,30,37,45,46], work–family conflict [18–20,44,46], fatigue [22,29,32], undefined work–social life boundary [11,28,44,46], isolation or loneliness [2,20,23,38,39]. The meta-analysis reports levels of poor sleep quality (56.4%), irritability (39.6%), psychological discomfort (38.8%), stress (28.4%), anxiety (23%), depression (22.6%), work–family conflicts (19.5%), fatigue (16.1%) and isolation (6.3%). Fewer studies highlight positive health effects, such as an improvement in well-being [25], less stress [35], less depression [12] and better work–social life balance [32,41]. Some studies highlight preventive measures applied to mitigate these harmful effects [12–14,29,34,42].

Our findings report that there is almost 100% unanimity that teleworking has a negative effect on mental health; on the contrary, just two studies emphasize its beneficial effects [35,43]. This divergence could depend on many variables, such as one's affinity for technology, the type of work carried out, the habits of the country in which the study is carried out, and not forgetting the influence of the pandemic in the most recent studies: the danger of contagion could have altered the interviewees' feelings of stress and anxiety [36,41,42].

The literature [47,49–51] confirms, therefore, that gender inequalities in the division of labor remained stable during the lockdown and that their consequences will be long-lasting. For mothers, supporting their children's education was a great challenge because they had to play the role of teachers and reconcile their children's distance learning with their own work [52]. The mental health of mothers is at greater risk of being negative [15,17,22–24,27,32,44,45,47] and is thus affected by this new responsibility and increased levels of stress, anxiety, tension and loss of control [19,47,52–54].

Kim et al. [47], for example, underlines, in his study of 28,633 participants in South Korea, differences in perceptions of anxiety symptoms and sleep; in fact, problems are analyzed between teleworkers and non-teleworkers: the results show that these symptoms are more prevalent among teleworkers. The incidence is higher, especially in women.

In addition to the above-mentioned cross-sectional studies, there are three systematic review studies worth mentioning: one from Brazil [46], which distinguishes between full-time and part-time teleworkers and highlights that the former are at higher risk of mental health problems, while part-time telework can bring advantages—better balance between social and work life, better communication and social relationship; and one from Italy [48], where most of the reviewed articles show an increase in telework-related stress levels in study participants, especially in women. Another systematic review by Nowrouzi-Kia [55] examines the relationship between telecommuting and mental health and shows a complex relationship, in which high psychological distress becomes a key determinant of presenteeism and absenteeism. Factors like an increasing workload, social isolation and challenges in adapting home environments into favourable workspaces concur with high levels of psychological distress among telecommuters. Furthermore this study underlines how illness causes presenteeism (i.e., working while sick), decreased productivity (e.g., difficulty in being productive due to inadequate ergonomic settings, protracted periods of inactivity) and disengagement (e.g., when a worker, usually women, disengages from work because they have to take care of family and household duties).

Regarding preventive measures, three studies [12,31,39] emphasize the importance of flexibility and alternating work in the office and work from home as elements capable of improving workers' mental health; two studies [14,34] emphasize psychological and technical support; two studies [13,42] emphasize the primary role of support from superiors and colleagues to in coping with the problems caused by the uncertainty of the work–social life–family boundary.

Although our research aims to study the health effects of teleworking and associated preventive measures, we cannot fail to point out that several articles cited in this study refer to the pandemic crisis due to COVID-19, which has accelerated a pre-existing digitization process by encouraging teleworking.

In fact, In Italy, from February 2020 to September 2021, as a result of the COVID-19 lockdown [1], teleworking was made mandatory to enable the regular performance of work activities; this obligation continued until 2023 for so-called "fragile" workers, suffering from chronic diseases, and thus at serious risk to their health and lives, in the case of COVID-19.

Today, the shift to telework can be conceived as one to a stable form that will continue to reshape the future of work; in fact, more and more companies are using telework in a way that benefits both the economy and society as a whole.

Certainly, teleworking represents a new approach to work organization that overcomes all the traditional constraints, from physical space to predefined schedules, to work tools, based on the autonomy and empowerment of workers; furthermore, according to research published in 2023 [56], teleworking in Italy would cut about 40% of the per capita emissions produced by a worker in a year.

5. Conclusions

The aim of this systematic review is to investigate the effects of teleworking on mental health. Through this research, a satisfactory number of studies were found that have addressed this topic in recent years. Concerning the possible limitations of this systematic review, we need to underline that there are only a few longitudinal studies, which investigate the consequences of teleworking over a longer period, and only a few randomized clinical studies, which can demonstrate the cause–effect relationship more clearly and objectively.

The strengths of this study are represented by the revolution that this type of approach brings for the management of mental health for teleworkers; in fact, the results obtained demonstrate the presence of a correlation between teleworking and mental health effects. The results obtained also demonstrate that preventive measures are also necessary; in fact, only a few studies put forward proposals to improve the health conditions of teleworkers, with the hope that these will be taken into consideration by employers and workers' organizations, whose task it is to ensure a suitable working environment for all, with the engagement of the occupational physician.

Overall, while teleworking has shown positive impacts on individuals' health and work–life balance, there is a need to address potential challenges and ensure a sustainable and healthy teleworking environment for all workers.

Future research could focus on the assessment of different psychosocial risks, such as working time and intensity, autonomy, and decision-making freedom, because the long-term impact of psychosocial factors on teleworking from home should be evaluated. It is desirable that institutional policies contribute to the promotion of teleworking in all companies through subsidies and other financial incentives. Organizations, both public and private, that currently use teleworking should, in the future, monitor and take steps to avoid the potential negative effects of teleworking which, as we have pointed out, can lead to major changes in working conditions and can affect the health and living conditions of teleworkers.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/su16188278/s1, PRISMA Checklist [57].

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