EDITORIAL ARTICLE
REVIEW ARTICLE

MAPPING MENTAL HEALTH INTERVENTIONS DURING THE COVID-19 PANDEMIC. A COMPARISON REVIEW OF CHINA AND WESTERN EUROPE

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ABSTRACT

The aim: To map and compare mental health interventions during the Covid-19 pandemic in China and Western-Europe. The focus was specifically on the availability, duration, target group, content, setting, and outcomes of the interventions.

Materials and methods: A scoping review was conducted by utilising several scientific databases. A total of 479 articles were found after removing the duplicate records. After screening, 36 articles were included in the study. Relevant intervention characteristics were systematically mapped, and compared within and among countries.

Conclusions: All interventions had shared aims to improve the psychological resilience and to reduce psychological distress. In particular, anxiety- and depression-related symptoms were commonly addressed. On average, interventions in China were larger scaled, had longer durations, and often used combinations of strategies such as therapies and exercises both in-person and remotely. Interventions in Western-Europe tend to be locally implemented on a smaller scale, and often used a single strategy. Most Chinese interventions targeted adolescents, while all interventions in Western-Europe were meant for adults. Most interventions were assessed using quantitative methods using various mental health scales, showing statistically significant effects in improving mental health.

KEY WORDS: Mental health, MHPSS, Intervention, Covid-19, Pandemic

INTRODUCTION

In the last decades, pandemics have yielded insight into their impacts on mental health, as observed during the SARS pandemic and Ebola pandemic [1]. In both cases, various forms of psychological distress were prevalent among the affected population [2; 3]. During any pandemic, psychological factors play important roles in how people cope with the threat of the infection and consequent losses among other things [4]. Moreover, these factors influence the adherence to public health measures and therefore seem to have an impact that extends beyond mental health itself [5]. While persons who are prone to psychological issues are especially vulnerable, during pandemics, everyone is at risk of developing mental health problems due to constant uncertainty and changes in lifestyles [6]. On top of that, the impact pandemics have on mental health can last even after the pandemic has subsided [7]. Interventions that improve people's overall mental health resilience in specific pandemic circumstances, combat additional psychological burdens, and provide fundamental support need to be implemented in order to limit the negative effects of a pandemic on a population's mental wellbeing. Furthermore, care delivery for persons with mental health disorders might need adaptations, since the structural circumstances and personal needs may change in these

situations. However, in times of pandemics, it is common that health professionals, scientists, and policymakers focus predominantly on the prevention and treatment of the disease itself, whereby secondary psychological implications are often underestimated and neglected [8].

The ongoing Covid-19 pandemic which started in 2019, has created an unprecedented global health challenge, not only on the pathogen level but also on social aspects including mental health [9]. Uncertain prognosis, severe shortages of public and private resources, imposition of unfamiliar public health measures that limit personal freedoms, and conflicting messages from authorities are among the major factors that contribute to emotional distress and an increased risk of mental health disorders [10]. Furthermore, social isolation and loneliness as a consequence of these factors seem to have significant influences on the wellbeing of the global population [11]. The need for mental health interventions to provide care to affected individuals, and to prevent mental health damage is urgent, in order to minimise the psychosocial sequelae of the Covid-19 pandemic [1].

Developing and implementing evidence-based mental health interventions is crucial, especially in times of rapidly spreading pandemics such as the current Covid-19 pandemic [12]. Demands and possibilities in both content and

Table I. Eligibility criteria

Inclusion criteria	Exclusion criteria
- The article was published after 2020 - The research setting included China and Western Europe (Austria, Belgium, France, Germany, Liechtenstein, Luxembourg, Monaco, Netherlands, Switzerland) - The article is written in English - The article included information about mental health interventions that were developed, carried out, or adapted during the Covid-19 pandemic - The article included any form of evaluation of the given intervention - Qualitative, quantitative, and mixed-methods researches	- No description of the context in which the intervention, program, or service has been conducted - The content of the intervention, program, or service is not clear - Not clear who participated in the intervention - The article did not include any form of evaluation of the intervention, program, or service - Any type of reviews

way of delivery of mental health interventions in the post-Covid time differ from that of pre-Covid, due to specific consequences of this pandemic. Moreover, interventions and outcomes may be context-specific, not only because the severity of the pandemic differs per place, but also due to differences in cultures, economies, and politics, among other things [13]. Context is a key aspect, and extensive characterisation of context improves the understanding of the effectiveness of interventions that aim to improve the (mental) health of populations [13]. Mapping assessed mental health interventions in different contexts may gain an understanding of what works in which context, contributing to the development of relevant, evidence-based interventions.

A previous study has shown that comparing mental health systems across different countries is an important tool for management guidance and policy planning [14]. Nevertheless, a rich understanding of the context is needed before new approaches in other environments are implemented. A comparison of distinctive different contexts will provide insight into the tendencies and relationships between contexts and interventions, and might contribute to quick translations of effective interventions to similar settings, and strategic design of novel interventions. To make a starting point, this paper will discuss mental health interventions under the Covid-19 pandemic in China and Western- Europe. In China, where the pandemic started, the situation was brought back under control relatively quickly, compared to Western-Europe, which was still struggling with the increasing infections at the end of 2021. In addition, it can be cautiously said that the society in China is more collective compared to the individualistic society of Western-Europe, which is to some extent at the forefront when it comes to implementing interventions [15].

THE AIM

The aim of this research was to explore the similarities, differences, and tendencies in countries with distinctive different contextual settings, as such in China and Western-Europe. The focus was specifically on the availability, duration, target group, content, setting, and outcomes of the interventions, in order to map and compare important contextual intervention characteristics.

MATERIALS AND METHODS

STUDY DESIGN

This study aimed to map available mental health interventions during the Covid-19 pandemic in Western-Europe and China, to compare intervention characteristics by performing a scoping review. The UN geoscheme classification was used in determining which country to be considered as parts of Western-Europe, namely: Austria, Belgium, France, Germany, Liechtenstein, Luxembourg, Monaco, Netherlands, and Switzerland.

DATA COLLECTION

Data was collected by systematically utilising several scientific databases such as: Web of Science, PubMed, APA PsycInfo, and Psychology and Behavioural Sciences collection. Search terms that stand for the following concepts were developed: mental health, interventions, outcomes, the Covid-19 pandemic and regions. The concepts were logically derived from the study's interest, namely mental health interventions and their outcomes during the Covid-19 pandemic in countries in Western-Europe and China.

INCLUSION AND EXCLUSION

Collected data were screened using Rayyan, a web-based application for systematic screening. The selection of articles was guided by reviewing the title, abstract, and lastly the full-text. Each step was conducted by two reviewers who assessed whether or not to include the articles, based on the criteria shown in Table I. It was decided to include both qualitative and quantitative studies in this review, in order to not limit the types of outcomes the interventions accomplished. A total of 479 articles were found after removing the duplicate records. After screening, 36 articles were included in the study.

QUALITY APPRAISAL

In order to assess the methodological quality of the articles used in this review, a critical appraisal tool was used . The Mixed Method Appraisal Tool (MMAT) [16] is a critical appraisal tool that is designed for the appraisal
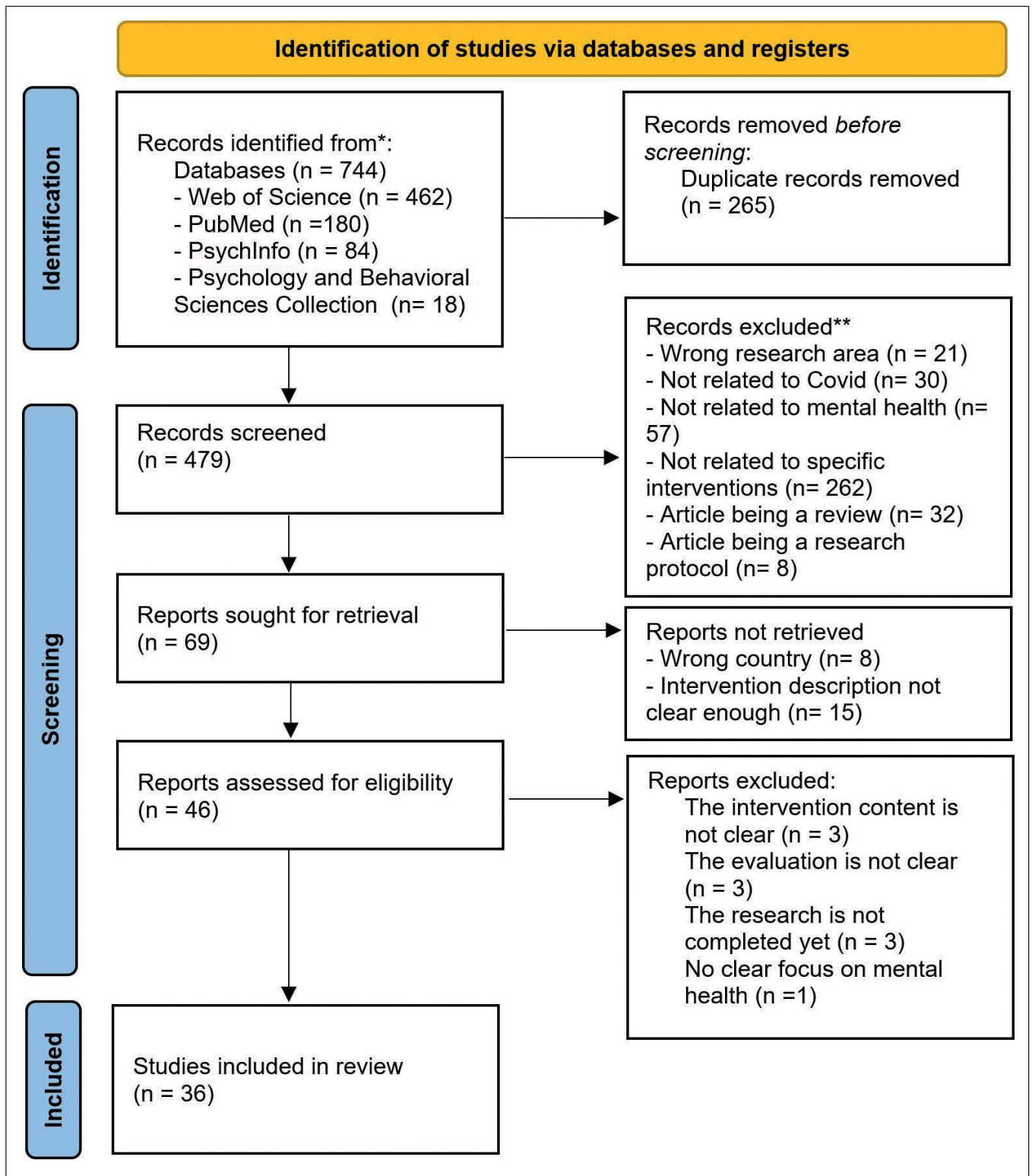
Fig. 1. PRISMA diagram

stage of reviews that include qualitative, quantitative, and mixed methods studies. The choice of this specific tool is due to its capacity to appraise a wider scope of studies. In this review, we looked into mental health interventions that were already assessed or evaluated using several methodologies, and the MMAT tool allows us to incorporate different models of empirical studies and appraise methodologies and designs. The tool consisted of five questions related to the quality of the studies, which could be answered with yes or no. The studies were carefully appraised, and articles with more than three no's were excluded.

DATA ANALYSIS

Core information that derived from the aim of this study, such as duration, target group, content, setting, and outcomes of the interventions were systematically used to compare the components within, and among the countries. Additionally, the methodologies used in examining the interventions were mapped. The systematically summarised interventions were compared, both as individual interventions, and per characteristic.

REVIEW AND DISCUSSION

This review identified 36 articles that explored the impact of mental health interventions during the Covid-19 pandemic in China and countries in Western-Europe, as shown in the PRISMA diagram (see Figure 1). While 26 of the interventions were carried out in China, the remaining ten were from countries in Western-Europe, specifically Germany (5), the Netherlands (2), France (2) Belgium (1). The identified interventions had shared aims of improving psychological resilience and reducing psychological distress. The majority of the interventions targeted individuals who were suffering from mental health related issues, rather than aiming for prevention. In addition, most interventions excluded persons with severe mental health disorders. This section will unpack the characteristics of the identified interventions in order to achieve the aim of this paper, namely, to map the target groups, content, and outcomes. A summary table with detailed characteristics of the interventions can be found in the appendix. Moreover, the designs of the studies that examined the interventions will be discussed as well.

TARGET GROUPS

The interventions targeted a variety of groups of individuals, which can be categorised into the following: 1.Adolescents and students, 2.The elderly population 3.Adults with underlying risks, 4.Hospital in-patients, 5.Healthcare workers, and 6.The general public. The category of adults with underlying risks stands for adults who carry factors with them that might increase the potential of mental health distress, such as having chronic diseases or being an informal caregiver. The category of the general public consists of interventions that did not target specific age groups, living conditions, or professions.

A relatively large part (35%) of the Chinese interventions have been carried out to improve the mental health of adolescents, students, and hospital in-patients. In contrast to this, these two groups were the least addressed in Western-Europe. All Hospital in-patients in this review consisted of patients (potentially) infected with the Coronavirus. Healthcare workers and the elderly population were less often the specific targets of mental health interventions. However, the elderly population often seemed to be covered within the hospital in-patient group. Seven interventions targeted the broad general public, predominantly aiming for improving psychological resilience.

INTERVENTION TYPES AND CONTENT

Eight types of interventions were identified: In-person interventions, In-persons interventions in combination with another type of intervention, remote intervention, remote intervention in combination with another type of intervention, web-based self-guided intervention, in-person physical exercise, remote physical exercise, and robot intervention. In-person interventions stand for psychological interventions conducted in-person under supervision, whereas remote interventions were conducted from a distance using tools such as Zoom and WeChat. Web-based interventions consisted of self-guided interventions carried out using platforms such as websites and WeChat. In-person and remote physical exercises such as aerobics were rarely carried out as single interventions, but were often used in combination with the earlier mentioned types of interventions. All interventions, except for a robot-based one, were either one of the above-mentioned interventions, or a combination of them (e.g. in-person psychological intervention in combination with web-based self-guided intervention). While interventions in China often combined psychological interventions with other types of interventions, Western-Europe only carried out single interventions. Within these types, both group-based, and individual-based interventions were observed. In particular, in-person physical exercises implemented alongside psychological interventions were always carried out in groups. Eleven out of the eighteen psychological interventions conducted in China were group interventions, whereas in Western-Europe, three out of six interventions were conducted in groups.

For adolescents and students, the Chinese interventions shared the characteristic that they were all group interventions. Furthermore, six out of the nine interventions consisted of a combination of psychological interventions and supervised physical exercises. Mindfulness and group counseling were commonly used approaches [17,18,19,20]. The only Western-European intervention that targeted the adolescentes and students was a web-based self-guided intervention [21].

For the elderly population, all Chinese interventions were combinations of psychological interventions and physical exercises or web-based self-guided interventions. For psychological interventions, reminiscence therapy and psychological education were used [22,23]. In Western-Europe, one remote group scheme therapy and one robot-based intervention were conducted. The scheme therapy was an adapted version for remote use of an existing therapy. [24]

All Chinese interventions that targeted adults with underlying risks were single interventions consisting of remote psychological interventions and web-based self-guided interventions. Additionally, all these interventions had educational aspects. The two interventions carried out in Western-Europe were both psychological interventions that focused on enhancing social contact.

A large part of the intervention targeting hospital in-patients consisted of in-person and remote psychological

interventions such as relaxation training, counselling, and adapted existing therapy. Web-based self-guided intervention techniques were also used in three out of six interventions, which offered patients with educational material and support groups [25,26;27].

The only Chinese intervention that targeted healthcare workers was a tailored and extensive in-person intervention that provided a team of healthcare workers with a support scheme including chat groups, broadcasts, and after-work group events [17]. The two interventions in Western-Europe were both psychological interventions consisting of individual EMDR therapy and a group workshop. [28,29]

Most interventions that targeted the general public were web-based self-guided interventions in both China and Western-Europe. While interventions in China mainly focused on pandemic-related education [29,30,32], the Western- European interventions provided participants with educational material related to techniques to improve mental health [33,34].

INTERVENTION DURATION

Interventions that lasted longer than a week represented 40% of the studies from Western-Europe and 42% of the ones from China. The majority of the interventions lasted longer than a month, most of them seen among the articles settled in China, 11 articles against 4 from Western-Europe.

INTERVENTION OUTCOMES

Although the majority of the interventions addressed psychological resilience and psychological distress of the participants, a huge variety of mental health measurement scales were used to examine the intervention outcomes. Most studies used the scales for baseline measurement and post-intervention measurement to evaluate the effectiveness of the intervention. All scales used the Likert point scale, indicating that the points increase or decrease can be carefully compared between interventions to a certain extent, even when different scales are used that measure similar matters [35]

A summary of the 38 identified scales can be found in the appendix. While most scales were only used in single interventions, the Self-rating Anxiety Scale(SAS)(eight times in China), Self-rating Depression Scale(SDS)(six times in China), Generalised Anxiety Disorder Scale(GAD-7)(four times in China), Positive- and negative affection scale(PANAS)(three times in China), and Patient Health Questionnaire(PHQ-9)(four times in China, three times in Western-Europe) were more commonly used. Four studies [36,37,38,39] failed to find significant effects of the interventions, and two interventions [29,24] did not provide any quantitative outcomes, while measurement scales were used during the study. However, three of these studies provided qualitative data indicating positive experiences of the participants.

The remaining 30 studies (24 from China and six from Western-Europe) reported significant effects of their inter-

vention. However, the degree of the improvements of the scales varied to a great extent. For instance, in the adolescent group, the intervention of Cheng et al [40] decreased the SAS score by 16.0±5.3, while interventions of Li & Liu [31] and Zhang et al [41] decreased this score by 7.13±5.59 and 7.20±5.56, respectively, while having similar base-line scores. Cheng et al [40] 's intervention, which showed the largest decrease in this scale that measures the severity of anxiety, combined remote group mindfulness training with supervised aerobic exercises and had a relatively long duration.

For the elderly population, different scales that measure the degree of loneliness were used in two studies [22,40]. In the intervention of Ren et al [22], the ULS Loneliness Scale decreased by 3.65±2.36, the self-developed loneliness scale of Follmann et al [42] only decreased by 1.0 on average after the intervention.

Interventions targeting adults with underlying risks are less comparable than that of other target groups, due to its variety of participants. However, it strikes that all West European studies [38,39] could not find significant effects. Two Chinese interventions targeted informal caregivers of eating disorder patients and children with autism [37,42] While the Guo et al [37] intervention did not achieve significant reduction of anxiety and depression, the intervention of Liu et al [43] observed a decrease in both scores(6.01 in SAS, and 5.92 in SDS). Both interventions were remotely conducted educational interventions, but the latter had a longer duration.

Five studies that explored interventions targeting Covid-19 patients used anxiety and depression related scales to evaluate the effect of their interventions. Interventions of Li et al [44] and Fan et al [45] had no significant effect or showed any differences between the control group that did not receive the intervention. Liu et al [26] 's intervention decreased the SAS by 13.71 and SDS by 13.94, and Hu et al [27]'s intervention decreased these scales by 10.26 and 10.0 respectively. Both interventions made use of web-based self-guided tools.

The Chinese intervention [28] that targeted a team of healthcare workers used an unique Daily mood index(D-MI) scale that guided the content of the intervention, and evaluated the effectiveness of the intervention at the same time. This tailored intervention managed to maintain the DMI between seven and nine out of ten for the duration of the intervention. For Western-Europe, Tarquinio [28] 's intervention using remote EMDR therapy had a significant effect on the improvement of anxiety and depression among nurses, as can be seen in the reduction of the HAD anxiety score(-8.5) and HAD depression score(-6.1).

In China, interventions targeting the general public were predominantly evaluated using scales that measure anxiety and depression. However, only minimal decreases in the scales were observed [30,44,32]. All three interventions were web- based self-guided. Two interventions in Western-Europe [33,34] used the PHQ-9 to assess the effect of their interventions on the degree of depression. Both interventions decreased the PHQ-9 by 3.11 and 3.04, respectively.

RESEARCH DESIGN

The majority of the included studies (89%) used single quantitative research designs, as shown in figure 6. The most frequent type of design were the randomised control trial (RCTs) studies, which represented 77% of all studies. Among the researches in China, 65,4% of them were RCT's while 30% were from Western-Europe. Mixed-methods design consisted of cohort studies in combination with interviews and qualitative observations [42,24,29,38]. All mixed-methods studies were conducted in Western-Europe. In relation to sample sizes, both countries seemed to have a similar distribution. Most studies had a sample size of between 100 and 500 participants. Only a few studies organised follow-up measures to evaluate the long-term effects of the interventions.

What strikes throughout this mapping is that the majority of the included interventions were conducted in China on large scales. Furthermore, a large part of China's interventions targeted adolescents, and were often assessed using trials. In addition to China's physical scale, the centralised political context may have to do with more interventions being carried out in China [46]. As Pan et al [46] discusses, during the Covid-19 pandemic, a large amount of public health interventions were carried out in China under this norm. Furthermore, the epidemiological context might have influenced this as well. The majority of the Chinese interventions were carried out after China had brought the pandemic relatively under control. It should be mentioned that this review only included mental health interventions which were scientifically assessed. In both contexts, there might be locally implemented interventions which did not meet the criteria to be included in the review, remaining underexposed. Chinese schools are often used as places for interventions that aim for (mental) health promotion [47], whereas in Western-Europe, schools are often seen as places which are separated from personal intervenes [48], potentially explaining the target group trends.

Quantitative evaluation methods clearly predominated in the included studies. However, multiple studies indicate the benefits of using qualitative data in assessing the effectiveness of healthcare interventions [49; 50; 51]. It is worth noting that only interventions in Western-Europe were evaluated using qualitative methods. In addition, the cross-cultural generalisability of quantitative mental health measurement scales used in the included studies are questionable [52]. The majority of the Chinese studies dealt with this by adapting the scale in a cultural sensitive manner. Nevertheless, it is hard to compare the effectiveness of the interventions between and within the countries, given the fact that a variety of scales have been used in assessing the intervention effects on similar mental health issues. While the degree varied, the majority of the included interventions from both regions showed statistically significant improvements in participant's mental health. However, due to the relatively small number of included interventions, the various assessment methods, and used scale to measure mental health, it is not possible to find trends in the effectiveness of the interventions.

CONCLUSIONS

This review identified 36 mental health interventions carried out during the Covid-19 pandemic in China and countries in Western-Europe. To be specific, only interventions from Germany, France, Belgium, and the Netherlands were found for Western-Europe. 72% of the identified interventions were conducted in China. All interventions had shared aims to improve psychological resilience and to reduce psychological distress. In particular, anxiety- and depression-related symptoms were commonly addressed. In general, it is possible to identify the following main trends in the included interventions:

-   The nature of the interventions in China covered a large number of participants at once; the centralised political context dominated; carried out in communities and with the participation of local self-government; often targeted adolescents; was more combined and complex (combination of psychological exercises and physical activity); took place mostly under the supervision of instructors; the quantitative criterion for evaluating the effectiveness of programs dominated

-   The specificity of the implemented interventions in Western Europe was characterised by a smaller number of such interventions; the predominance of individual-oriented and local nature of programs; dominated by a qualitative criterion for assessing the effectiveness of programs

-   Although differences in target groups and approaches were observed, most interventions in both settings achieved significant positive improvements on participant's mental health

-   Combination interventions were not seen in the Western-European interventions. Instead, remote psychological interventions such as counseling, and web-based self-guided interventions were commonly used

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