Tele-Health Psychological Interventions in Breast Cancer at the Time of Coronavirus: A Narrative Review

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Abstract: *Introduction:* During the recent pandemic-related health emergency of COVID-19, the health system care has undergone several substantial and sudden changes to benefit the populations of patients affected by COVID-19 delaying the diagnosis and treatment of all other patients. One of the most vulnerable populations during this period was the oncological population. The use of telemedicine has become necessary to compensate for all this by forging medical and psychological support at a distance.

Objectives: The purpose of this narrative review is to offer an overview of the literature on present scientific papers regarding tele-health psychological interventions aimed at breast cancer patients during the pandemic period of COVID-19 and discussing the reported effects.

Methods: This narrative review has been realized through a revision of the scientific literature conducted from August to October 2023 using the following electronic databases: "PubMed", "Science Direct" and "Google Scholar" typing keywords related to the pandemic period, breast cancer population and telehealth psychological interventions. For the evaluation of the effects of the interventions, the statistical indices of p-value and effect size measures were considered.

Results: Online mindfulness-based interventions have been found to be significant in reducing anxiety, depression and sleep problems, and in improving self-perception of body image, quality of life, and self-efficacy. No significant results are detected in the reduction of depression symptoms and stress levels between groups.

Discussions: Very limited studies investigated the topic. Further research is needed to better understand the efficacy of telepsychology during the pandemic period and deepen research in terms of other therapeutic approaches and other methods of treatment delivery. In addition, interventions based on a systemic approach, that involve both health care workers and caregivers, can be more effective for the overall well-being of breast cancer patients.

Keywords: Psychoncology, Breast cancer, COVID-19, Coronavirus, Cancer, Telemedicine, Telepsychology, Psychological interventions, iMBSR, CALM.

INTRODUCTION

COVID-19 Era, Health System Care and Oncology Population

Recently, the population has witnessed a worldwide pandemic that has plagued humanity for several years. The COVID-19 pandemic, in addition to being a real threat to people's health and physical safety, has caused several negative consequences; for example: social restrictions, economic pressure, fear, and stress have impacted people's mental health resulting in increased perceived psychological problems (Salari *et al*., 2020). In addition, the danger of the virus has led to a drastic revolution in the health care system, giving priority to patients suffering from COVID-19, resulting in delays in screening programs and diagnostic services, in taking charge and treatment of all other populations of patients (Richard *et al*., 2020). Cancer patients are regarded as a highly vulnerable group due to weakened immune systems caused by both tumor growth and anti-cancer treatment and have been found to have particularly adverse outcomes with COVID-19 (Pinato *et al*., 2020). Furthermore, cancer patients due to COVID-19, had greater concern regarding the susceptibility to infection and about their cancer outcome (Salehi *et al*., 2022). Finally, a recent meta-analysis that investigated cancer population in general, shows clinically significant prevalence rates psychopathological symptoms such as depression (32.5%), anxiety (31.3%), post-traumatic stress disorder (PTSD; 28.2%), stress (53.9%), sleep problems (23.2%), and fear of cancer progression/recurrence (67.4%) during COVID-19 (Zhang *et al*., 2022).

Breast Cancer Population

Breast cancer is the most diagnosed cancer worldwide, and its burden has been rising over the past decades. Breast cancer (BC) currently has a prevalence of almost 8 million cases, an incidence of over 2 million new cases, and has led to the death of

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about 685,000 individuals in 2020 (World Health Organization, 2020). Patients with BC frequently experience psychological distress related to diagnosis, fear of uncertainty, physical symptoms, sexual problems, cognitive difficulties, negative body image, and adverse therapy effects (Dooley *et al*., 2017; Iddrisu *et al*., 2020). Additionally, BC patients commonly manifest psychological problems, such as depression and anxiety that seem to be correlated with poorer outcome and mortality (Wang *et al*., 2020). Worry and rumination also negatively effect the distress related to cancer, increasing pain and self-reported physical problems (Renna *et al*., 2021). The main symptoms experienced by patients with BC (Denieffe & Gonney, 2011; So *et al*., 2021) are shown in Table **1**. Finally, pre-existing mental conditions can exacerbate during the Covid-19 pandemic (Murphy *et al*., 2021).

Table 1: Mainly Symptoms Experienced Among Breast Cancer Patients

Symptom Experience Among BC Prior and During Treatment	
Physical Symptoms	**Psychological Symptoms**
Pain	Anxiety
Fatigue	Depression
Hair Loss	Sexual problems
Skin changes	Negative body-image
Weight loss/ weight gain	Change in roles
Nausea and vomiting	Loss of control and autonomy
Fertility problems	Sleep disturbance
Taste changes	Cognitive difficulties (*e.g.,* concentration, memory.)
Gastrointestinal problems	Irritability and anger
Lack of appetite	Mood swings

Breast Cancer During COVID-19 Era

Few studies investigated psychological distress among breast cancer patients during the COVID-19 pandemic.

A study conducted by Stanizzo and colleagues (2022) investigated the presence of psychopathological symptoms among breast cancer patients during the COVID-19 period. In their results, more than 50% of the sample reported clinically significant levels of anxiety and more than 70% have clinically significant depressive symptoms. Furthermore, they detected that almost 50% of the sample presented post-traumatic stress symptoms (PTSS) in individuals manifesting symptoms related to the cancer diagnosis. Except for depression symptoms, they detected that the levels of psychopathology were more severe than before COVID-19.

Another study conducted by Massicotte and colleagues (2021) among breast cancer patients during the COVID-19 pandemic highlighted the association between a higher concern related to the COVID-19 and higher levels of anxiety, depression, insomnia, and fear of cancer recurrence (FCR).

Definition of Telemedicine and Telepsychology

The intersection of technology and healthcare systems gives birth to telemedicine. The World Health Organization (WHO, 2021) defines Telemedicine as, “The delivery of healthcare services, where distance is a critical factor, by all healthcare professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation and for the continuing education of healthcare providers, all in the interests of advancing the health of individuals and their communities.”

Across telehealth services, there is telepsychology that is defined as the use of any of a variety of telecommunication technologies to provide mental health interventions (American Psychological Association; APA, 2015).

Telehealth and telepsychology can be delivered by asynchronous technology, meaning there is a time-lapse between the transmission and reception of the communication or by synchronous technology. The latter means that communication occurs in real-time. Examples of delivery modality for telehealth and telepsychology are apps, email, video call, audio call, video consulting, and web-based communications (McCord *et al*., 2020).

Breast Cancer and Telemedicine before COVID-19 Era

A recent systematic review conducted by Koç and colleagues (2022) investigated the effects of telehealth and telepsychology interventions in a breast cancer population. The aim of all psychological interventions of the included studies were to improve the mental health of breast cancer patients. Results suggest a reduction of fear of cancer recurrence (Van den Berg *et al*.,

2015), psychological distress (Freeman *et al*., 2015; Lally *et al*., 2018; Van den Berg *et al*., 2015; Zhu *et al*., 2017), intrusive thoughts (Lally *et al*., 2018), depressive symptoms (Cleary & Stanton, 2015; Lonzano-Lonzano *et al*., 2016; Lally *et al*., 2018; Smith *et al*., 2019; Zhu *et al*., 2017), anxiety symptoms (Lonzano-Lonzano *et al*., 2016; Zhu *et al*., 2017), sleep problems and insomnia (Freeman *et al*., 2015; Zachariae *et al*., 2018), and an improvement in quality of life (Ashing & Miller, 2016; Freeman *et al*., 2015; Kim *et al*., 2018; Lonzano-Lonzano *et al*., 2016; Zhu *et al*., 2017). However, other studies included in the review did not detect significant improvement of psychopathological symptoms.

In light of the above, with health system modifications and restrictions due to Covid-19, it became necessary to use telemedicine to cope with the demand for medical and psychological support (*e.g*., video-consulting), especially of patients with cancer (Shirke *et al*., 2020) and such modality of support could be beneficial in cancer patients also after the Covid-19 outbreak.

RATIONALE FOR THE CURRENT STUDY AND OBJECTIVES

To date, there are no reviews in the scientific literature about digital psychological interventions conducted during the COVID-19 pandemic in the breast cancer population.

Knowledge of tele-health psychological interventions proposed during the COVID-19 pandemic to the population with BC is an important issue given the difficulty of not being able to regularly conduct psychological support meetings in presence during such a critical period. Knowing the type of psychological interventions proposed and the effects of these on the psychological well-being of the oncological population with BC in a time of isolation and strong psychological distress could implement the psychological health system in a pandemic context and contribute with a valid support during situations with similar characteristics. The objective of this narrative review is to offer an overview of the literature on online psychological interventions carried out during the COVID-19 pandemic in the population with BC.

METHODS

The present narrative review is conducted following the SANRA criteria (Baethge *et al*., 2019) and has been realized through a revision of the scientific literature using the following electronic databases: “PubMed”, “Science Direct”, and “Google Scholar”. The research was carried out from August to October 2023 and the following keywords were used:

- To search for the period of the COVID-19 pandemic: “COVID-19”, “pandemic", “coronavirus”;
- To search about the type of cancer: "breast cancer", “mammary cancer”, “breast tumor”, “mammary tumor”;
- To search about the type of psychological intervention: "online psychological intervention"; “remote psychological intervention”; “web-based psychological intervention”; “digital psychological intervention”.

Boolean words have been used to link keywords. Specifically, the entry "OR" was used to link the keywords related to the same themes and the entry "AND" to link the keywords belonging to different concepts.

Studies were included if: i) they conducted any type of psychological intervention (*e.g*., mindfulness-based, cognitive behavioral therapy, psychoanalysis); ii) the mode of delivery of the intervention was remote (*e.g*., online platform, video-chat; telephone, smartphone app); iii) they have breast cancer patients as the target population of the intervention (any stage of disease); iv) they have psychological symptoms as the target of the intervention; v) they conducted the psychological intervention during any phase of the COVID-19 pandemic; vi) they are randomized controlled trials; viii) they are longitudinal studies; ix) they have quantitative pre- and post- intervention outcomes; x) they have investigated the effect of psychological interventions through specific indices (*e.g*., p-value, effect size); xi) they were written in English.

Studies were excluded if: i) the target population for the intervention was not breast cancer; ii) they were not conducted during the COVID-19 pandemic; iii) they were not conducted in a digital modality or remotely; iv) they do not offer data regarding the effect size of the intervention (pre-post- intervention data); v) they solely evaluate physical symptoms and do not target psychological problems; v) protocols; vi) letters to

editors; vii) they report only qualitative information; viii) not written in English.

Effect Size

For effect size measurement reference, we referred to the effect size measures known in statistics (Lakens, 2013).

One of most utilized in scientific research is Cohen d (1988). The effect size range classification is as follows (see Table **2**):

Table 2: The Effect Size Range Classification (Cohen, 1988)

Coehn d	Effect Size
0 < x < 0.2	No significant effects
0.2 ≤ x < 0.5	Small
0.5 ≤ x < 0.8	Medium
from 0.8 upwards	Large

P- value

For p-value measurement reference has been made to the Fisher guidelines (1950). There is no predetermined range of significance, but the level of significance is fixed according to the probability of error (alpha; α). However, a p-value (p) of 0.05 is conventionally used as the minimum level of significance (α = 5%; Bakan, 1966). See Table **3** for further clarification on significance levels and α index.

RESULTS

Three studies met the inclusion criteria of this narrative review (Chang *et al*., 2022; Kang *et al*., 2021; Pang *et al*., 2023). All studies have been published between 2020 and 2023 (one for each year of publication) in China. Two of three studies are randomized controlled trials (RCT; Chang *et al*., 2022; Pang *et al*., 2023), one is a longitudinal study (Kang *et al*., 2021). Regarding RCT studies, one has a waiting list group as the control group (Chang *et al*., 2022), the other one has a care as usual group (Pag *et al*., 2023). Two out three of the studies used mindfulness-based techniques (internet mindfulness-based stress reduction; iMBSR; Chang *et al*., 2022; Kang *et al*., 2021; see supplementary material), one used Managing Cancer and Living Meaningfully (CALM; see supplementary material) therapy. The duration of the intervention varied from 6 to 12 weeks and the number of sessions ranged from 6 to 8 meetings. All studies measured the outcome through self-report tests. The description of the characteristics and results of the studies are summarized in Table **4**.

DISCUSSION

COVID-19 posed a serious health threat, and negatively impacted on physical and mental (Salari *et al*., 2020) well-being of the worldwide population with a drastic and rapid revolution in the health care system at the expense of some patient populations (Richard *et al*., 2020). One of the most vulnerable population of patients was the oncology one due to weakened immune systems (Pinato *et al*., 2020). Oncology patients, in addition to facing a threatening diagnosis and uncertain fate, also had to experience fear of COVID-19 infection and the presence of psychopathological symptoms (*e.g*. anxiety and depression; Zhang *et al*., 2022). All this can negatively be affected on cancer outcomes. The use of telemedicine has become necessary to offer medical and psychological support at a distance.

There are no reviews about telepsychology interventions among breast cancer patients in scientific literature during the COVID-19 era.

The aim of this narrative review is to offer an overview of scientific literature regarding tele-health psychological interventions on breast cancer patients during the period of COVID-19 and discussing the reported effects.

Table 3: Common Boundaries of Fixed Significance in Terms of p-Value and Alpha

P - value	α (%)	Comment on the Results
0.05	5%	we have a 5% chance of getting false positives
0.01	1%	we have a 1% chance of getting false positives
0.001	<1%	we have less than 1% chance of getting false positives

Table 4: Tele-Health Psychological Interventions Among BC Patients During the COVID-19 Pandemic

Auth-ors	Sample size (n)	Cancer stage	Time from diagnosis (years)	Treatment	Surgery	Study design	DR n(%)	Intervention group (n)	Type of intervention	Comparison group (n)	Assessment	Effects of the interventions
Chang *et al*., 2022	67	all stages (0 to IV)	different time from diagnosis (2-5)	Chemiotherapy; Radiotherapy; Hormone Therapy; Other	Mastecto-my	RCT	8 (11.11%)	41	iMBSR (2h weekly group for a total of 6 weeks + 10/15 min home practice at least twice daily.	WL (n= 26)	Depression, anxiety Stress, and Scale (DASS-21; Lovibond & Lovibond, 1996) Body mental imagery (Hopwood *et al*., 2001) The general Self-Efficacy Scale (GSES; Schwarezer & Jesuralem, 1995)	Significant reduction in all symptomatology (within iMBSR group). No significant reduction in depression (p = 0.918) and stress (p = 0.277) symptoms between groups. Significant reduction in anxiety symptoms (p = 0.041) between groups (medium effect size; Cohen's d: 0.55) significant improvement self-efficacy (p = 0.004) and self-body image (p = 0.003) perception between groups (large effect size; respectively Cohen's d: 0.73; 0.73).
Kang *et al*., 2021	48	not reported	not reported	not reported	Breast surgery (radical, modified, conservative)	LS	19 (39.58%)	partial attendees (9; < 4 sessions) completers (20; ≥4 sessions)	iMBSR (2.5 h weekly, for a total of 8 weeks + 45 min home meditation practices for 6 days out 7)	absentees group (n=19)*	Patient Health Questionnaire – chinese version (PHQ-9; Chen *et al*., 2015) Generalized Anxiety Disorder Scale Chinese version (GAD-7; he & Li, 2010) The Pittsburgh Sleep Quality Index chinese version (PSQI; Lu *et al*., 2014)	Significant reduction in anxiety, depression, and insomnia symptoms (large effect size within iMBSR group respectively Cohen's d 1.83; 1.95; 1.87). Greater symptoms reduction rate in individuals that spent ≥ 30 min for session. No significant reduction in anxiety, depression, and insomnia symptoms in the absentees group.
Pang *et al*., 2023	60	not reported	not reported	not reported	Mastecto my, Lumpecto my, and no surgery	RCT	0 (0)	30	Online CALM (45-60 min, once every 2 weeks, over 12 weeks) First intervention in person.	care as usual (12 weeks; n=30)	Sleep Quality Scale (SQS; Yi *et al*., 2006) The Prospective and Retrospective Memory Questionnaire (PRMQ; Crawford *et al*., 2003) The Psychological Distress Thermometer (DT; Holland *et al*., 2010) Quality of life scale (bibliographical source not available)	Significant reduction in stress levels, significant improvement QoL, sleep and cognitive functions after the intervention than the baseline in the CALM group (p <0.001 each one). Statistically more satisfactory results in the CALM group than care usual group (p < 0.001 each item of symptoms).

Legend: DR: dropout rate; iMBSR: Internet Mindfulness-based Stress Reduction (based on Kabat-Zinn, 2003); CALM: Managing Cancer and Living Meaningfully (Rodin et al., 2018); RCT: Randomized Control Trial; LS: Longitudinal Study; WL: waiting-list; * not randomized: they have participated to the study evaluation at pre and post intervention time but choose to not do the intervention.

Telehealth Mindfulness-Based Interventions

A very limited number of studies investigated the effects of mindfulness-based interventions among BC patients during the pandemic period (Chang *et al*., 2022; Kang *et al*., 2021).

Outcomes Within Intervention Group

Regarding the p-value measures (see Table **3**), online mindfulness-based interventions seem to be effective in significantly reducing psychological symptoms post treatment rather than baseline on breast cancer patients in anxiety, depression, sleep problems, stress, negative body image, and low self-efficacy (see Table **4**; Chang *et al*., 2022; Kang *et al*., 2021).

These results are in accordance with the studies prior COVID-19 (see Table **5**) present in literature in the efficacy of internet-based mindfulness interventions on breast cancer patients (*e.g*. Lengacher *et al*., 2018) except for sleep problems. Possible explanations can be found in limited sample size (Faber & Fonseca, 2014), different scores at The Pittsburgh Sleep Quality Index (PSQI) at baseline in the intervention of the two

Table 5: Comparison in Dropout Rates and Mindfulness-Based Interventions's Effect Size Prior and During COVID-19

Period	During COVID (studies included in this narrative review)	Prior COVID-19	Prior COVID-19
Authors	Chang *et al*., 2022; Kang *et al*., 2021	Matis *et al*., 2020	Lengacher *et al*., 2018
Study design	(this) Narrative review	Systematic review	RCT
Type of the intervention	iMBSR	eMBPs	iMBSR
Population sample	BC patients	Oncology patients	BC patients
Cancer stage	0-IV	any	0-III
Time for the diagnosis	any	not reported	not reported
Treatment	yes	yes	yes
Surgery	yes	not reported	yes
DR (%)	11.11 - 39.58 %	6 - 46%	6.67%
DR mean (%)	25.3%	25.3%	6.67%
Assessment	see table 4	not reported	Fatigue symptom Inventory (Hann *et al.,* 2000) Brief pain Inventory (Keller *et al*., 2004) The Pittsburgh Sleep Quality Index (PSQI; Carpenter & Andrykowski, 1998). Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1997) State Trait Anxiety Inventory (STAI; Spielberg *et al*., 1970) Perceived Stress Scale (PSS; Cohen *et al*., 1983) (Concern about Recurrence Scale; Vickberg, 2003) Short form health Survey (SF-36; Ware, 1993) The Everyday Cognition (ECog; Farias *et al*., 2008) Five Facet Mindfulness Questionnaire (Baer *et al*., 2008)
P value (pre/post intervention within the intervention group)	Significant improvement in: • sleep problems/insomnia • anxiety symptoms • depression symptoms • self-efficacy • self-body image	not reported	Significant improvement in: • anxiety • depression symptoms • stress • fear of recurrence • fatigue • mindfulness • QoL (Physical health, general health, emotional well-being, energy) No significant improvement • sleep quality • pain • everyday cognition functioning (except for language subscale)
P value (comparison between groups)	Significant improvement: • anxiety symptoms • self-body image • self-efficacy • sleep problems/insomnia No significant improvement: • depression symptoms Heterogenous results: • stress levels	not reported	no comparison group provided

Effect size within intervention group	• anxiety (large) • depression (large) • insomnia symptoms (large)	• anxiety (no effect to large) • depression (no effect to large) • fatigue (no effect to medium) • General Health/QoL (no effect to medium) • pain (no effect to small) • post-traumatic growth (small to medium) • sleep problems (no effect to medium) • stress (no effect to large)	• anxiety (medium) • depression (large) • fatigue (medium) • fear of recurrence (medium) • pain (no effect) • sleep quality (small) • stress (large)
Effect size between groups (intervention vs. no intervention group)	• anxiety (medium) • depression (no effect size) • self-body image (large) • self-efficacy (large) • stress (small)	• anxiety (no effect to medium) • depression (no effect to medium) • fatigue (no effect to large) • general health/ QoL (no effect to medium) • pain (no effect to small) • post-traumatic growth (no effect to small) • sleep problems no effect to large) • stress (no effect to medium)	no comparison group provided
Follow-up	not provided	Within groups: • anxiety (small to medium) • depression (small to medium) • fatigue (large) • General Health/ QoL (small) • pain (not investigated) • post-traumatic growth (not investigated) • sleep problems (not investigated) • stress (no effect to medium) Between groups: • stress (no effect to medium) • anxiety (no effect to medium) • depression (no effect to medium) • fatigue (no effect to medium) • sleep (no effect to small) • general health/QoL (no effect to small) • pain (no effect) • post traumatic growth (no effect to small)	not provided

Legend: DR: dropout rate; eMBPs: eHealth mindfulness-based programs; iMBSR: internet Mindfulness based Stress Reduction. RCT: Randomized Control Trial.

studies and therefore the degree of severity of departure of sleep problems. Other possible explanations can be found in the presence of other psychopathological (*e.g*., depression, anxiety) and physical symptoms (eg., fatigue, pain) that can specifically interfere with sleep quality (Strik *et al*., 2021). However, Lengacher and colleagues (2018) found no significant reduction in sleep problems (total PSQI score), it is worth noting the fact that they found significant reduction in subscale “daytime dysfunction”, a crucial aspect often reported by those suffering from sleep disorders (APA, 2013).

Regarding the effect size (see Table **2**), the study during COVID-19 (Kang *et al*., 2020) has effect size in line or bigger than those prior the COVID-19 pandemic in breast cancer populations (Lengacher *et al*., 2018; see Table **5**) and oncology populations in general (Matis *et al*., 2020). One of the possible explanations, can be found in the time difference spent for home practice that have an important role for the effectiveness of the intervention (Kang *et al*., 2020). Other possible explanations can be found in the differences existing regarding the characteristics of the interventions performed (duration, frequency, formal vs. informal meditation (Kakoschke *et al*., 2021), type of contents in the sessions, device through which the intervention was delivered (integrative approaches in addition to pure MBSR used in the intervention), and psychometric characteristics of the different tests used to collect pre- and post-intervention measurements.

Although the measure of effect size is more reliable than p-value (for example p-value is influenced by sample size, effect size no; Sullivan & Feinn, 2012), when studies differ in many respects, such as those described above, it is difficult to determine whether the measure of the effect is caused by the parameter of our interest (before/after covid) or other variables (Sullivan & Feinn, 2012).

Outcomes Between Groups (Intervention Group vs. Comparison Group)

There is a general significant reduction in symptomatology between groups (see Table **4**) except for depressive symptoms and perceived stress (Chang *et al*., 2020). This, can be addressed by i) limited number of samples; ii) sample characteristics (Riedl & Schüßler, 2022; Cohee *et al*., 2020) *e.g*. marital status, age, cancer stage, time from diagnosis, personality traits (Izci *et al*., 2018); forms of treatment in place at the time of assessment (Cvetković, & Nenadović, 2016); type of surgery (Den Oudsten *et al*., 2009) iii)

the severity level of the symptomatology at baseline and how long BC patients experience symptoms (Blom *et al*., 2007; Riedl & Schüßler, 2022); iv) intervention characteristics (duration; frequency, home practices); v) psychometric properties of the test utilized for the assessment. vi) the changing in severity of psychopathological symptomatology could vary independently from the performed intervention, because of the contextual variations and the different phases of the pandemic period (eg., lockdown phases, number of deaths; Bu *et al*., 2023). Regarding depression symptoms specifically, another possible explanation can be addressed to a spontaneous resolution of symptomatology with the passing of time (Whiteford *et al*., 2013). Finally, the fact of being aware that shortly after they would have done a psychological intervention could have anxiolytic-properties and positive effects on stress levels.

Regarding the effect size measure, results during COVID-19 period (Chang *et al*., 2022) in BC patients are in line with those before the COVID-19 outbreak in oncology population (Matis *et al*., 2020; see Table **5**).

Dropout Rates

Dropout rates (see Table **5**) in online mindfulness-based interventions during COVID-19 period are in line (Kang *et al*., 2021) with e-health psychological mindfulness-based interventions before COVID-19 in oncology patients (Matis *et al*., 2020). However, regarding BC population in the specific, a lower dropout rate is detected prior to COVID-19 (Lengacher *et al*., 2018).

Possible explanations could be found in the intervention characteristics (Fincham *et al*., 2023; *e.g*., presence of sessions in person, time to dedicate to home practices, individual vs. group session, type of professional figure conducting the intervention; duration of the intervention, intervention's device, methodological issues) and sample characteristics (hopeless and/or helpless traits, coping based on avoidance, expectations of intervention; severity of psychopathology, time from diagnosis, having or having not undergone surgery, difference in the tumor stage and/or size, different outcomes of prognosis). In addition, a variable that may have played an important role in defining the attrition level could be personal expectations related to the intervention (see Kang *et al*., 2021).

Further investigations are necessary to identify variables associated with the degree of adhesion of treatment in this kind of population.

Telehealth CALM Interventions

Only one study (Pang *et al*., 2023) investigated the CALM intervention among BC patients during the pandemic period.

Outcomes Within Group and Between Groups

Online CALM interventions seem to be effective in reduction of stress levels and improve QoL (Pang *et al*., 2023; see Table **4**) and more effectively than care as usual (Pang *et al*., 2023). These results are in accordance with those made in presence prior COVID-19 (Ding *et al*., 2020).

Pang and colleagues (2023) also found improved cognitive functions with CALM intervention and more significant improvement than care as usual (Pang *et al*., 2023). These results are in line with those prior COVID-19 pandemic that found a significant reduction of cognitive difficulties mediating by the effect of CALM treatment on systemic inflammatory response (especially on the pan-immune-inflammation value; PIV a marker that has a negative correlation with cognitive functions; Yao *et al*., 2022). Furthermore, Ding and colleagues, (2020) found a positive correlation between QoL and cognitive functions.

Dropout Rates

The attrition rate found during COVID-19 period was 0% (Pang *et al*., 2023). This rate is significantly lower than those detected in presence prior COVID-19 (above19%; Ding and more than 30%; Yao *et al*., 2022).

Some possible explanations are: i) difference in online mode vs in presence; ii) characteristics in the intervention (*e.g.,* duration of the interventions); iii) complications regarding the severity of disease; iv) personality traits; v) motivation.

Further investigations are necessary to identify variables associated with the degree of adhesion of treatment in this kind of population and specifically in online mode.

Limits

Although the present study offers a panoramic regarding the online psychological interventions proposed in the breast cancer population during the COVID-19 pandemic, there are several limitations to report. First, the number of studies included in this narrative review is very limited. Furthermore, one of the studies included in this narrative review has a small

sample size. In addition, some of them have methodical issues (eg., lack of description of the characteristics of the tests used for assessment; lack of the control group, lack of randomization in recruitment, lack of follow-up time) or not reported the intervention's effect size (one out three).

In addition, the articles included in this narrative review are all studies that have used the online modality to deliver the psychological intervention. Other forms of telepsychology were not detected in the literature to treat patients with BC during the pandemic.

Finally, there are no information about other different therapeutic approaches, other than CALM and iMBSR interventions.

Clinical Implications and Future Directions

Knowledge of tele-health psychological interventions proposed during the COVID-19 pandemic in the population with BC is an important issue given the difficulty of not being able to regularly conduct psychological support meetings in presence during such a critical period. Knowing the type of psychological interventions proposed, which psychological symptoms are the target of the interventions, the effectiveness in terms of p-value and effect size of these interventions on the psychological well-being of the oncological population with BC in a time of isolation and strong psychological distress could implement the psychological health system in a pandemic context. In addition, all this information could also be useful in all those situations that undermine, at least in part, the pandemic period (*e.g*., quarantine in mononucleosis, sense of helplessness during natural calamities, etc.).

Online psychological interventions during a pandemic seem to be a useful, feasible, and effective tool to improve mental health of cancer patients. Further investigations are needed to explore other modalities to deliver the treatment (eg., smartphone app; virtual reality) and other psychotherapeutic approaches.

Furthermore, given the limited availability of literature studies, it can be useful to conduct further research about the effectiveness of mindfulness-based interventions among breast cancer patients during a pandemic situation.

More rigorous research methodologies seem to be needed in the future (randomized recruitment, detailed description of assessment modes, use of tests with good psychometric properties, use of a control group within the study, use of effect size measures, presence of a follow-up measurement to assess long-term effects of the intervention).

Another important aspect is the attrition rate. In future research, it could be useful to interview people who decide not to finish the treatment to identify and modify the variables responsible for drop-out, improving the adherence rates to treatment.

A future direction may also be to investigate the effect of the intervention on physical symptoms (*e.g*., pain, fatigue, nausea, gastrointestinal problems).

Finally, a systemic approach involving not only patients but also caregivers (see Treanor, 2020) and healthcare professionals (see Łaskawiec *et al*., 2022) could be useful.

SUPPLEMENTAL MATERIALS

Managing Cancer and Living Meaningfully (CALM)

CALM therapy is a psychotherapeutic intervention developed for oncology patients in advanced care by doctors at the Global Institute of Psychosocial, Palliative & End-of-Life Care (GIPPEC; Lo *et al*., 2014) at the Princess Margaret Cancer Centre in Toronto.

The theoretical foundations of CALM therapy include relational theory, which emphasizes the joint creation of meaning between therapist and patient (Mitchell, 1988); attachment theory, which encourages attention to different styles of accessing support in the face of threat (Bowlby, 1982); and existential theory, which focuses on dilemmas associated with confronting mortality and the finality of existence (Yalom, 2020).

CALM therapy consists of three to six sessions, usually of 45 minutes, delivered across 3 to 6 months. The sessions address four domains: (1) symptom management and communication with health care providers; (2) changes in self and relations with close others; (3) spiritual well-being or the sense of meaning and purpose; and (4) preparing for the future, sustaining hope, and facing mortality (Sethi *et al*., 2020).

The contents of the intervention are summarized in Table **6**. CALM is feasible and found evidence of improvement in depression, death anxiety, spiritual well-being, and attachment security (Lo *et al*., 2014; Lo *et al*., 2019)

Table 6: Main Contents of CALM Intervention (Sethi *et al.,* 2020)

Domains	Contents
Symptom management and communication with health care providers	Therapy is focused on the patient's symptoms and relationships with healthcare professionals. The aim is to facilitate the patient's active involvement in medical care and increase the collaborative degree with healthcare professionals for optimal symptom control and medical decision making.
Changes in self and relations with close others	Therapy is focused on patient's relationships with close friends and family in the context of having an advanced disease. The aim is to facilitate expressions of grief and loss of previous self-concept and social roles, and to facilitate the request for support towards others.
Spiritual well-being or the sense of meaning and purpose	Therapy is focused on patient's spiritual beliefs and/or sense of meaning and purpose in life. The aim is to support and encourage understanding of the personal meaning of suffering and dying and reevaluation of priorities and values in the face of advanced disease.
Preparing for the future, sustaining hope and facing mortality	Therapy is focused on the patient's attitudes toward the future, hopes and fears about living/dying with from advanced disease. The aim is to encourage acknowledgement of anticipatory fears and anxieties and may facilitate attention to advanced care planning, life closure, and death preparation.

Table 7: iMBSR Intervention Protocol (Chang et al., 2022)

Session (n)	Contents	Mindfulness practice in session	Home practices
1	• introduction to the class, how to proceed, requirements and challenges • introduce the relationship between brain function, emotion, and cognition • internal and external interactions: the relationship between situation, thoughts, sensations, bodily sensations, and actions • differences between past, future and present • awareness and autopilot mode	• motivation and intention: why am I here? • identify concerns • mindful eating	• mindful eating • self-awareness of worry (or other strong emotions)
2	• the negative cycle of worry • how thoughts affect mood, physical feelings • introduce the cognitive model (stimuli – thoughts – actions) • the mode of doing and the mode of being of the mind • myocardial training: focus and awareness	• mindful eating • breath awareness practice • be aware of negative cycle of worry	• the negative cycle of worry • breath awareness practice • mindful eating
3	• see the chaotic mind, from the breath into the presence mode • be aware of the distraction and gently bring the focus back to the breath • be aware of the inertial reaction pattern, and emotional cycle is wave after wave • resist unwanted, disliked, unpleasant • ideas are not facts • the second arrow Theory of Suffering	• breath awareness practice • awareness of inertial response patterns • distinguish pain and suffering	• breath awareness exercises when strong emotions arise • awareness of inertia and shooting arrows at yourself • mindfulness in daily life
4	• experience the true meaning of acceptance • story: fear in the heart – there are tigers in the closet • from rejection to acceptance • take care of yourself • introduce the principles of mindfulness	• breath awareness practice • three minutes breathing room • mindful walking	• stress awareness • take 3 min of breathing space during strong emotions • mindfulness in daily life
5	• introducing S.T.O.P. (stress reaction and response) • application of breath awareness • mindfulness guards the mood • observe the changes of mind and body • difficulties encountered in mindfulness practice	• three minutes breathing room • body scan	• S.T.O.P. • body scan • daily practice • a letter to myself
6	• common reactions to body scans • to be aware of the relationship between change and discomfort • explore with an open mind • thoughts and feelings are not me, just a part of me • mindfulness listening • the concept of loving-kindness	• three minutes breathing room • meta meditation practice • review the difficulties of the course and bless yourself	mindfulness practice for living

Mindfulness-Based Stress Reduction (MBSR)

MBSR is a group-based intervention program (Kabat-Zinn 1990) developed at the University of Massachusetts Medical Center in 1979 that focuses upon the progressive acquisition of mindful awareness, or mindfulness.

The standard program has weekly sessions of 2 – 2,5 hours and one all-day session after six to seven

weeks. Some use shorter weekly sessions (30 - 90 minutes) and some omit the all-day session. The weekly sessions have standardized core elements consisting of different mental and physical mindfulness exercises: 1) body-scan exercises, 2) mental exercises focusing one's attention on the breath, 3) physical exercises with focus on being aware of bodily sensations and one's own limits during the exercises, and 4) practicing being fully aware during everyday activities by using the breath as an anchor for the attention. Essential to all parts of the program is developing an accepting and non-reactive attitude to what one experiences in each moment (Kabat-Zinn 1990).

Between sessions participants are strongly encouraged to practice home practices for 30-45 minutes a day listening to audio recordings with guided exercises in body-scan, sitting mindfulness exercises focusing on breath and yoga stretching exercises.

An example of iMBSR intervention protocol is summarized in Table **7**.

ACRONYMS

BC: Breast Cancer

CALM: Managing Cancer and Living Meanfully

CBT: Cognitive Behavioral Therapy

DR: dropout rate

eMBPs: eHealth Mindfulness-Based Programs

FCR: Fear of Cancer Recurrence

iMBSR: Internet Mindfulness-Based Stress Reduction

LS: longitudinal study

PIV: pan-immune-inflammation value

PTSD: Post-Traumatic Stress Disorder

PTSS: Post-Traumatic Stress Symptoms

RCT: Randomized Controlled Trial

QoL: Quality of Life

WHO: World Health Organization

WL: waiting list

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