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REVIEW

Enablers and Barriers of Online Mindfulness-Based Interventions for Informal Carers: A Mixed-Methods Systematic Review

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Abstract

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Abstract

Objectives Informal carers are an integral part of any health care system. However, provision of informal care is associated

with caregiver burden and decreased wellbeing. Mindfulness programs can reduce caregiving burden and improve wellbe-

ing among informal carers, but they face challenges when participating in face-to-face programs. Studies have explored the

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effects of online delivery of mindfulness programs for informal carers. However, the enablers and barriers for participation

are not well understood. This review aimed to synthesise the evidence and provide a comprehensive understanding of the

enablers and barriers to participation in online mindfulness programs among this population.

Methods A mixed-methods systematic review was conducted following the Joanna Briggs Institute mixed-methods system-

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atic review approach and using eight databases. All empirical studies published in English and involving informal carers aged

over 18 years were included. Critical appraisal was conducted using the Mixed Methods Appraisal Tool. Thematic analysis

was conducted to integrate the data.

Results Nine studies were included: three quantitative, two qualitative, and four mixed methods. Three subthemes for ena-

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blers and barriers were developed. Three subthemes for enablers included self-motivation, positive experience of mindful-

ness, and program structure and delivery. Three subthemes for barriers included lack of self-motivation, external factors

preventing participation, and program structure and delivery. The enablers and barriers were interrelated within and across

the identified themes.

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the identified themes.

Conclusions A comprehensive synthesis of current evidence was provided for consideration when developing online mind-

fulness-based interventions for informal carers. Further investigation is recommended, particularly in relation to the enablers

and barriers to engagement by informal carers.

Preregistration The review protocol was registered with PROSPERO (CRD42023409311).

Keywords Enablers · Barriers · Informal Carers · Mindfulness · Online Delivery

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Informal carers are defined as individuals who provide care for family members, friends, or neighbours on a voluntary basis (Australian Institute of Health and Welfare, 2023). Informal carers fulfill an important role within the Australian health care system by enabling care recipients to continue living in their communities (Carers Australia, 2021). Approximately 10% of Australians are informal carers who provide care recipients with

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basic care, including activities of daily living, communication, and mobility (Australian Institute of Health and Welfare, 2023). Caregiving often predisposes carers to an increased risk of stress, burden, and depression (Kor et al., 2018) and decreased psychological wellbeing (Cunningham et al., 2019). Caregiving demands may also limit the ability of informal carers to engage in paid work or to participate in social and leisure activities

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(Australian Institute of Health and Welfare, 2023), which in turn can lead to feelings of isolation and ultimately reduced quality of life (Brown et al., 2017).

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Emerging evidence suggests that quality of life within the informal carer population can be improved by engaging with mindfulness activities (Contreras et al., 2022; Juberg et al., 2023; Simpson et al., 2023). Mindfulness-based interventions (MBI) have been defined as psychological interventions that combine the mind and body to decrease stress (Kor

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et al., 2018). Mindfulness-based interventions have been utilised within different populations of carers including those of people with dementia (Chacko et al., 2022) and identified as a valuable psychological intervention (Kor et al., 2018), yielding positive effects on health and wellbeing in this population, reducing mental health conditions (Appleton et al., 2020), depression, cancer, and cardiovascular disease (Parkinson et al., 2019).

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(Parkinson et al., 2019).

MBI have traditionally been delivered in face-to-face modes (Kabat-Zinn, 1982; Segal et al., 2002), but are being increasingly delivered online via pre-recorded guidance (Bailey et al., 2018), or via online courses with synchronous mindfulness practice sessions (Bogosian et al., 2021; Cavalera et al., 2019; Krusche et al., 2012). There are also many asynchronous online mindfulness applications available, with Headspace and Calm being two popular examples

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(Flett et al., 2019). Online mindfulness programs rapidly increased in popularity during the COVID-19 pandemic due to social distancing and enforced lock-downs (Zhang et al., 2020). Often during the pandemic, informal carers chose to self-isolate to reduce the risk of transmission to their care recipient (Bailey et al., 2022), making online interventions ideal for them. It is well recognised that this pandemic had a detrimental impact on people’s mental wellbeing (San-

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tomauro et al., 2021 ; Torales et al., 2020), including that of informal carers (Allen et al., 2022; Hughes et al., 2021; Rippon et al., 2023). Online access to MBI is particularly suitable for informal carers due to the remote delivery which allows them to balance the competing demands of care duties, particularly if they need to be at home with the care recipient, negating the need to make alternative care giving plans (Bogosian et al., 2021; Price-Blackshear et al., 2020).

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Asynchronous online applications, in particular, enable par - ticipants to access the course at their convenience (Mrazek et al., 2019), maintain their privacy (Price-Blackshear et al., 2020), and select activities based on individual preferences (Huberty et al., 2019).

Several systematic reviews have identified that online MBI may improve the mental health outcomes of a range of populations including students, employees, and patients

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(Gal et al., 2021; Jayawardene et al., 2017; Sommers-Spijk -
erman et al., 2021; Witarto et al., 2022; Zhang et al., 2020).
Despite the positive health outcomes of online MBI delivery
reported in the literature, these studies have also identified
poor adherence and high attrition among the participants
(Linardon & Fuller-Tyszkiewicz, 2020; Torous et al., 2020;
Yadav et al., 2022).Whilst there is a paucity of systematic reviews explor -

ing the barriers and enablers to MBI in informal carers, a recent systematic review among people with chronic conditions found adherence to the therapy can be enhanced with greater understanding of the program’s benefits, and by providing individualised support during practice (Marks et al., 2022), whereas barriers identified within previous research included time commitment, poor computer skills, health issues, and less motivation (Marks et al., 2022). To

the best of our knowledge, there is no review conducted which explores the barriers and enablers of online MBI for informal carers. A preliminary search of PROSPERO, MEDLINE, the Cochrane Database of Systematic Reviews, and Joanna Briggs Institute (JBI) Evidence Synthesis was conducted, whereby no current or in-progress systematic reviews on the topic were identified. Therefore, this sys - tematic review aimed to identify and explore the barriers

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and enablers of online MBI for informal carers.

Method

Review Design

This review followed the JBI methodology for mixed-methods systematic reviews (MMSR) featuring as a guide to synthesise and integrate qualitative, quantitative, and mixed-methods studies (Lizarondo et al., 2020). The protocol for the systematic review was developed via collaboration between all authors and registered with the International Prospective Register of Systematic Reviews, on 1 April 2023

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before data extraction commenced (CRD42023409311).

Search Strategy

A three-step search strategy was utilised in this review, in accordance with the JBI methodology (JBI, 2020). First, an initial limited search was undertaken using MEDLINE (Ovid) and PsycINFO (EBSCO) to identify the keywords and Mesh terms used. Second, the search was replicated using the finalised keywords and Mesh terms in the other databases including CINHAL Ultimate (EBSCO host), Web of Science,

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Cochrane Library, JBI, Scopus, and Embase (Elsevier). The search also included sources of unpublished studies and grey literature, such as ClinicalTrials.gov and BASE. The search strategy, including all identified keywords and index terms, was adapted for each included information source, whereby a second search was undertaken on 14 March 2023 prior to data analysis. A final search was undertaken on 01 January 2024 to identify any recent publications that were eligible for

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inclusion. The applied full search strategies are provided in Table S1 of the Supplementary Information. Lastly, a hand search was conducted to review the reference lists of selected study for critical appraisal, and Google Scholar searched to identify any articles missed by the database search.

Eligibility Criteria

Quantitative, qualitative, and mixed-methods studies that included data relevant to the research question were consid-

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ered for inclusion in the review. Mixed-methods studies that contained data from quantitative or qualitative components that could be extracted were also considered. Whilst grey literature comprising theses were included, we excluded letters to the editor, opinion pieces, systematic reviews, and editorials. The search strategy was guided by the PICo mnemonic: population, phenomena of interest, and context.

Population

This review considered studies that included informal carers

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aged 18 years and above. Studies that involved both informal carers and care recipients were included if findings related to informal carers could be extracted.

Phenomena of Interest

This review identified and explored the barriers and enablers that influence the delivery of online MBI, with the core component being the mindfulness-based activities. We included synchronous and asynchronous mindfulness-based stress reduction and mindfulness-based cognitive therapy,

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as well as any other intervention where mindfulness was the preliminary intervention. The review included studies with any data pertaining to barriers and enablers with no limits of period of intervention impacting informal carers in undertaking online MBI.

Context

This review considered literature describing the implementation of MBI within an online setting of any application. The duration of the intervention was not considered due to the scarcity of available literature in the area.

scarcity of available literature in the area.

Study Selection

Following the search, all identified citations were uploaded into EndNote 20 for the removal of duplicates. The remaining studies were then exported to Covidence for title, abstract, and full-text screen (Covidence Systematic Review Software, 2023). Titles and abstracts were then screened by two independent reviewers from the study team for assessment against the inclusion criteria. The full text of selected

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citations was then assessed against the inclusion criteria

by two independent reviewers from the study team for inclusion/exclusion. Disagreements between the reviewers

at the full-text review stage accounted for 18% of the cases

and were resolved through discussion with a third reviewer.

The included articles were then exported back to Endnote.

The results of the search and study selection are presented in

a PRISMA flow diagram (Page et al., 2021) (Fig. 1).

Quality Appraisal

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Quality Appraisal

Critical appraisal of included studies was conducted using the Mixed Methods Appraisal Tool (MMAT), which was designed to appraise quantitative, qualitative, and mixed-methods studies (Hong et al., 2018). The MMAT comprises two screening questions to ensure selection of only empirical studies for appraisal. Each category has five criteria to rate with either “yes”, “no”, and “can’t tell” (Hong et al., 2018). Two study team members were involved in appraising the

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methodological quality of the included studies. Similarly, any disagreement with the appraisal was resolved via discussion with the third study team member. Due to limited studies being available, no study was excluded based on its methodological quality (Table 1).

Data Extraction and Synthesis

Data from the included studies were extracted and are presented in Table 2. These data included study design, aim of the study, study population, characteristics of participants

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(age, sex, relationship to care recipient), sample size and online intervention (program duration, recommended daily practice, delivery type audio/video/webinar), data collection methods, data analysis, results, and attrition rate. Empirical data concerning the barriers and enablers for online mindfulness interventions were also extracted and are presented in Table 3.

Data synthesis was conducted using the convergent integrated approach which involved combining the “qualitised”

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data and qualitative data (Lizarondo et al., 2020). “Qualitised data” refer to quantitative results from experimental, observational, and quantitative components of mixed-methods studies that were transformed into textual descriptions or narrative interpretation in a way that answered the review questions by repeated detailed examination (Hong et al., 2017). Thematic synthesis was used to categorise and pool together data of similar meaning in order to form sub-

Chunk 32

themes (Harden & Thomas, 2008). Following this, codes were developed for each subtheme and deductively organised under the main themes for “Enablers to practicing online mindfulness” and “Barriers to practicing online mindfulness” (Table 3). To explore relationships between subthemes and main themes, a concept map was used to illustrate the relationships within and between the descriptive subthemes and main themes (Novak &

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Canas, 2008) (Fig. 2). Concept mapping is a graphical tool used to organise and represent knowledge hierarchically (Eppler, 2006; Novak & Canas, 2008). Considering the aim of this review, key concepts relating to each descriptive theme were identified and ranked from the most general and comprehensive concept presented at the top to the more specific and least general concepts presented at the bottom.

Results

Search Outcome

The search resulted in 373 retrieved records from the data-

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bases, of which 236 were duplicates. Following screening of titles and abstracts, 11 studies were assessed for eligibility as full text, resulting in 4 studies being included in the review. Three studies were retrieved from the citation search, with 8 studies identified by hand searching and 6 studies identified by grey literature, of which, 5 studies met the inclusion criteria. Accordingly, a total of 9 studies

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were included, as illustrated in Fig. 1.Methodological Quality of Included Studies

Both qualitative studies (Llaneza et al., 2022; Stjernsward & Hansson, 2020) had coherence between qualitative data sources, collection analysis, and interpretation with appropriate research questions for qualitative research followed by adequate data collection methods. Findings were also adequately derived from the data and results were sufficiently interpreted from data. All 4 mixed-methods studies

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(Atreya et al., 2018 ; Dragomanovich et al., 2021; Lunsky et al., 2021; Stjernsward & Hansson, 2017) had issues with interpretation of integration of qualitative and quantitative components. One study had issues with qualitative interpretation of results, and a lack of consideration for confounding factors (Dragomanovich et al., 2021). Another study had issues with sample selection, addressing divergences of quantitative and qualitative results, and the rationale for

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using a mixed-methods design (Stjernsward & Hansson, 2017). The other study also had issues with the rationale for a mixed-methods design, integration of findings, and interpretation of qualitative and quantitative results (Lunsky et al., 2021). Three randomised controlled trials had issues with blinded outcome assessors (Lange, 2020; Stjernsward & Hansson, 2018; Zarei et al., 2022). The methodological quality of the included studies is reported in Table 1.Record sidentified from*:

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Database s(n =373)

CINHAL (n=22)

Cochrane (n=45)

Embase (n=99)

JBI (n=15)

Medline (n=44)

PsycINFO(n=38)

Scopus (n=55)

Web of science (n=55)Records removed before

screenin g:

Duplicate record sremoved (n

=236)

Record sscreene d

(n =137)Records excluded* *

(n =126)

Report ssought for retrieval

(n =11)Report snot retrieved

(n=0)

Reports assessed for eligibilit y

(n =11)Report sexcluded: (n=7)

Wrong outcom e(n =2)

Wrong interventio n(n =1)

Conference abstract (n =2)

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Conference abstract (n =2)

Wrong population (n=2)Records identified from:

ClinicalTrials.gov (n=3)

BASE (n =3)

Citation searchin g(n =3)

Hand search (n=8)

Reports assessed for eligibilit y

(n =11) Report sexcluded:

Wrong population (n =1)

Wrong outcome (n =4)

Wrong intervention (n=1)

Studies included in revie w

(n =9)Identification of studies via databases and register s Identification of studie svia othe r

method snoitacifitnedI Screenin g Include dReport sscreened

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(n =1 7)Report sexcluded

(n =6)

Fig. 1 PRISMA flow diagram of the screening process 1261 Mindfulness (2024) 15:1257–1274

Table 1 Methodological quality assessment of included studies

Questions	Stjern-sward & Hansson, 2020	Stjernsward & Hansson, 2017	Drago-manovich et al., 2021	Llaneza et al., 2022	Atreya et al., 2018	Lange, 2020	Lunsky et al., 2021	Zarei et al., 2022	Stjern-sward & Hansson, 2018
S1. Are there clear research questions?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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S2. Do the collected
data allow to address
the research ques-
tions?Yes Yes Yes Yes Yes Yes Yes Yes Yes
Qualitative
1.1. Is the qualitative
approach appropriate
to answer the research
question?Yes Yes Yes Yes Yes Yes
1.2. Are the qualita-
tive data collection
methods adequate to
address the research
question?Yes Yes Yes Yes Yes Yes
1.3. Are the findings
adequately derived
from the data?Yes Yes Yes Yes Yes Yes
1.4. Is the interpretation
of results sufficiently

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of results sufficiently

substantiated by data?Yes Yes No Yes Yes Yes

1.5. Is there coherence

between qualitative

data sources, col-

lection, analysis and

interpretation?Yes Yes Yes Yes Yes Yes

RCT

2.1. Is randomization

appropriately per -

formed?Yes Yes Yes

2.2. Are the groups

comparable at base-

line?Yes Yes Yes

2.3. Are there complete

outcome data?Yes Yes Yes

2.4. Are outcome

assessors blinded

to the intervention

provided?No No No

2.5 Did the participants

adhere to the assigned

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2.5 Did the participants

adhere to the assigned

intervention?Yes Yes Yes

Non-randomised

3.1. Are the participants

representative of the

target population?Yes Yes Yes

3.2. Are measurements

appropriate regard-

ing both the outcome

and intervention (or

exposure)?Yes Yes Yes

3.3. Are there complete

outcome data?Yes Yes Yes 1262 Mindfulness (2024) 15:1257–1274

Table 1 (continued)

Questions Stjern-

sward &

Hansson,

2020Stjernsward &

Hansson, 2017Drago-

manovich et

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Hansson, 2017Drago-

manovich et

al., 2021Llaneza et al.,

2022Atreya

et al.,

2018Lange,

2020Lunsky et al.,

2021Zarei

et al.,

2022Stjern-

sward &

Hansson,

2018

3.4. Are the confound-

ers accounted for

in the design and

analysis?No Yes Yes

3.5. During the

study period, is

the intervention

administered (or

exposure occurred) as

intended?Yes Yes Yes

Quantitative descrip-

tive

4.1. Is the sampling strategy relevant to address the research question?Yes

4.2. Is the sample repre-

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question?Yes

4.2. Is the sample repre-

sentative of the target

population?Can’t tell

4.3. Are the measure-

ments appropriate?Yes

4.4. Is the risk of nonre-

sponse bias low?No

4.5. Is the statistical

analysis appropriate

to answer the research

question?Yes

Mixed-methods

5.1. Is there an adequate

rationale for using

a mixed-methods

design to address the

research question?No Yes Yes No

5.2. Are the different

components of the

study effectively inte-

grated to answer the

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study effectively inte-

grated to answer the

research question?Yes Yes Yes Yes

5.3. Are the outputs

of the integration

of qualitative and

quantitative com-

ponents adequately

interpreted?No No No No

5.4. Are divergences

and inconsistencies

between quantitative

and qualitative results

adequately addressed?Can’t tell Yes Yes No

5.5. Do the different

components of the

study adhere to the

quality criteria of

each tradition of the

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quality criteria of

each tradition of the

methods involved?No Yes Yes Yes 1263 Mindfulness (2024) 15:1257–1274

Table 2 Summary of the population demographics, interventions, data collection, analysis, and findings of the included studies

Study, country, study

designStudy aim Participants (age, sex,

relationship)Online intervention Data collection

methodData analysis Findings Comment

Stjernsward and

Hansson (2020)

Sweden

QualitativeTo explore the users’

experiences of a

web-based mind-

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experiences of a
web-based mind-
fulness program,
including motiva-
tion and challenges
to use10 informal carers of
a person with men-
tal illness or somatic
illness.
Mean age 57.6 years
old, 9 females, 9
partners8 weeks web-based
MBI (2 × 10 min/
day, 6 days)—audio/
video files, instruc-
tion to daily mind-
fulness practices;
a time log, and a
private diarySemi-structured
phone interview
after 10 weeksContent analysis Results confirmed the
importance of sup-
porting motivation

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importance of sup-
porting motivation
and adherence to
online MBI, with
the potential for
enhanced outcomesExplored enablers and
barriers of online
MBI. Small sample
size, homogeneity in
demography

Llaneza et al. (2022)

USA

QualitativeTo determine barriers
and facilitators of
mHealth mindful-
ness therapy in
caregivers of older
adults with cogni-
tive impairment15 informal carers to
cognitive impaired
older adult age 65
and above.
Mean age 61.86 years
old, 14 females, 8

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Mean age 61.86 years

old, 14 females, 8

adult children8 weeks web-based

MBI (set practice

goals based on

participants needs,

Mindfulness Coach

app)Semi-structured

telephone interview

(15–30 min, last

data collection for

the parent study was

December 2020,

data collection for

this study was from

Jan 2021 to April

2021)Inductive-deductive

analysisSelf-directed mHealth

delivered mindful-

ness therapy may

be a promising

intervention for the

carersExplored enablers and

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carersExplored enablers and

barriers of online

MBI. Small sample

size, homogeneity in

demography

Stjernsward and

Hansson (2017)

Sweden

Mixed-methodsTo explore the value

and usability of a

web-based MBI15 relative/significant

other of a person

with mental health

problems.

Mean age 51 years

old, 14 females, 5

parents, 5 partners8 weeks web-based

MBI (2 × 10 min, 6

days)

Audio/video files,

instructions for

daily mindfulness

exercises, a time

log, and a private

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exercises, a time
log, and a private
diarySemi-structured
phone interviews at
3 months follow-up.
Post-intervention
(n = 78) and
3-month follow-up
usability survey data
(n = 57)Qualitative data were
analysed with con-
tent analysis.
Quantitative data
analysis was under -
taken with descrip-
tive statisticsProgram was accept-
able, usable, and
valued by the
participants. 77%
of participants
recommended the
program to othersExplored enablers and
barriers of online

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barriers of online
MBI. Small sample
size, homogeneity in
demography
Atreya et al. (2018)
USA
Mixed-methods
(Dyadic intervention,
n = 53)To assess feasibility,
acceptability and
preliminary efficacy
of an online MBI
among patients and
caregivers20 informal caregiv -
ers of colorectal
cancer patients.
Median age 51 years
old, 8 males, 13
significant others8 weeks audio-based
MBI (15–20 min
per day practice, 5
days per week)
A MP3 player
pre-loaded with
8 mindfulness

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A MP3 player
pre-loaded with
8 mindfulness
practices, a study
booklet containing a
practice diaryPre- and post-symp-
toms and wellbeing
survey
Pre- and post-inter -
vention semi-struc-
tured focus group
interview (n = 6)Inductive content
analysis for qualita-
tive data. Quantita-
tive data analysis
was undertaken
with paired t-tests
pre- and post-
intervention (4 and
8 weeks)Program was of
interest to, feasible,
and acceptable
for patients with
metastatic gastroin-

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for patients with
metastatic gastroin-
testinal cancer and
carers.
Consistent with quan-
titative findings,
71% of participants
reported benefit at
post-intervention
qualitative inter -
views. 20% attri-
tion rateIdentified enablers
and barriers through
recruitment, pre-
study interview and
adherence. Explored
barriers to participa-
tion. Small sample
size, homogeneity in
demography 1264 Mindfulness (2024) 15:1257–1274
Table 2 (continued)
Study, country, study

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Table 2 (continued)

Study, country, study design	Study aim	Participants (age, sex, relationship)	Online intervention	Data collection method	Data analysis	Findings	Comment
Dragomanovich et al. (2021) USA Mixed-methods (Dyadic intervention, n-69)	To evaluate the feasibility, acceptability, and estimate efficacy of an 8-week web-based mindfulness program	23 informal carers of metastatic cancer patients. Age not given, 12 males, 15 spouse/partner	8 weeks web-based MBI				

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spouse/partner8 weeks web-based

MBI

One track per day, 5

days per week + an

hour weekly webi-

nar (15 min teach-

ing, 20 min guided

MBI, Q&A)Pre- and post-symp-

toms and wellbeing

survey,

Single question survey

for potential adverse

effects

Semi-structured

telephone interview

at week 8Qualitative data

analysed with

thematic analysis

Quantitative data

was analysed via

descriptive statistics

for feasibility and

acceptability dataProgram was feasible

and acceptable

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and acceptable
for patients with
metastatic gastro-
intestinal cancer
and carers. 88%
of respondents
reported a positive
experience in post-
intervention qualita-
tive interviews. 29%
attrition rateIdentified enablers
and barriers through
recruitment, pre-
study interview, and
adherence. Explored
barriers to participa-
tion.
Small sample size, lack
of a control arm, use
of multiple
comparisons, and low
interactive webinar
attendance
Lunsky et al. (2021)
Canada

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attendance

Lunsky et al. (2021)

Canada

Mixed-methodsTo identify feasibility, adherence, acceptability of online MBI and explore the outcome of online MBI39 parents of adolescents and adults of autistic. Mean age 52.68, 35 mothers6 weeks group-based web MBCT (90 min Zoom session per week) 10–15 min audio practice recordingOutcome measured at baseline, post-intervention, and 3-month follow-upLinear mixed-effect modelling was employed as the primary tool to

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modelling was
employed as the
primary tool to
examine the inter -
vention effectInterventions was
feasible, acceptable,
and led to improved
clinical outcomes.
53% attrition rateIdentified enablers
and barriers through
retention and open-
ended questions
at the end of the
program
Zarei et al. (2022)
Canada
RCT To evaluate the feasi-
bility and effective-
ness of an online
MBCT among infor -
mal carers of people
with dementia26 informal carers of
a person living with
dementia.

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a person living with

dementia.

Mean age 60 years

old, 23 females, 18

adult children8 weeks web-based

MBI via group

conference (30–45

min/day, + 2 h/week

video conference)

“The Mindful Way

Workbook” +

practice log + snack

pack of raisingsPre-intervention inter -

view, post-inter -

vention satisfaction

questionnaire at

week 8, follow-up

questionnaire 4

weeks afterQuantitative analysis

was undertaken with

t-test and U tests

to identify changes

pre- and post-inter -

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to identify changes
pre- and post-inter -
ventionTele-MBCT is a feasi-
ble intervention and
may improve psy -
chological outcomes
and adaptive coping
in family carers
of people with
dementia. 88.8%
were satisfied with
the online delivery
method. 8% attri-
tion rateIdentified enablers
and barriers through
recruitment and
retention.
Small sample size,
homogeneity in
demography 1265 Mindfulness (2024) 15:1257–1274
Table 2 (continued)
Study, country, study

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Table 2 (continued)

Study, country, study

designStudy aim Participants (age, sex,

relationship)Online intervention Data collection

methodData analysis Findings Comment

Lange (2020)

UK

RCT To investigate the

feasibility and

acceptability of an

online MBI15 informal carers

(8 in intervention

group) of stroke

survivors. Mean age

62.13 years old, 5

males, all spouse/

partner4 weeks web-based

MBI (10–20 min/

daily, allowed 6

weeks to complete)Survey at baseline

(demographic

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(demographic
information, Barthel
Index), post-inter -
vention (Internet
Evaluation and
Utility Question-
naire) and follow-up
at 3 months (not
reported in the
study)
One interview with
withdrawn partici-
pantQualitative data ana-
lysed using content
analysis. Quantita-
tive data analysis
was undertaken with
descriptive statisticsResults suggest
limited feasibility of
extending the cur -
rent methodology to
a larger trial.
Five participants
completed online
MBI and feedback

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completed online
MBI and feedback
indicated the MBI
was acceptable to
them.
62.5% and 14% attri-
tion rate respec-
tively for interven-
tion and control
groupIdentified enablers
and barriers through
recruitment and
retention. Explored
enablers and barriers.
Small sample size
Stjernsward and
Hansson (2018)
Sweden
RCT To assess the effec-
tiveness and usabil-
ity of a web-based
MBI for families
living with mental
or somatic illness196 relative/sig-
nificant other to a

Chunk 66

nificant other to a
person with mental
or somatic illnesses
Mean age 52.5 years
old, 47% parents8 weeks web-based
MBI (2 × 10 min, 6
days)
Audio/video files,
instructions for
daily mindfulness
exercises, a time
log, and a private
diaryOnline questionnaires
at baseline (T1),
post-intervention
(T2), and 3-month
follow-up (T3)General linear models
were performed to
evaluate between
group comparisons
of the intervention’s
impact on primary
and secondary

Chunk 67

impact on primary

and secondary

outcomesSignificant improve-

ments were found

in the primary

outcome mindful-

ness, with mainly

medium effect sizes

in both the global

sum scale and all

subscales both post-

intervention and

at follow-up. 30%,

29% attrition rate

at T2 and T3Identified enablers and

barriers through free

text answers in post-

questionnaires

Chunk 68

text answers in post-

questionnaires

MBCT, mindfulness-based cognitive therapy; RCT , randomised controlled trial; MBI, mindfulness-based interventions 1266 Mindfulness (2024) 15:1257–1274

Table 3 Data extraction of the included studies related to enablers and barriers of practicing online MBI

Studies Enablers Barriers Suggestion for the program+

Atreya et al. (2018) Better support for the care recipient

Desire to help with research

Learn a new skill

Help with sleep

Promote relaxation

Chunk 69

Help with sleep

Promote relaxation

Curiosity

Asist to focus/train/organise

thoughts

Positive experience with meditationTime constraint

Life circumstances

Technology issues

Difficulty to understand the pro-

gram structure

Prefer an alternate strategy for

copingBuild on favourite tracks

Provide longer and shorter track

options

Select male or female voices

Dragomanovich et al. (2021) Better support for the care recipient

Improve coping skills

Assist to stay in the present

Help with sleep

Chunk 70

Assist to stay in the present

Help with sleep

Curiosity

Assist to focus/train/organise

thoughts

Learn a new skill

Reduce anxietyTime constraint

Life circumstances

Technology issues

Prefer an alternate strategy for

coping

Lange (2020) Flexible and accessible interven-

tions

Improve coping skills

Opportunity for self-care

Positive experience with meditationTime constraints

Personal characteristics

Life circumstances

Technology issues

View program as a stressorMore mid-week practice reminders

Chunk 71

Llaneza et al. (2022) Flexible and accessible intervention

Improve coping skills

Use of mindfulness skills in daily

lifeTime constraints

Life circumstances

Personal characteristicsAllow personalised individual

schedule

Live support options

Additional phone calls reminders

Lunsky et al. (2021) Flexible and accessible interven-

tions

Improve coping skills

Helpful to be with other carers in

a group

Closed Facebook group was usefulTime constraint

Life circumstances

Chunk 72

Life circumstances

Personal characteristicsAutomatic reminders in calendar

Posting of recordings of sessions

More instructions to participate in an

online forum

Stjernsward and Hansson

(2020)Flexible and accessible intervention

Improve coping skills

Desire to help with research

Opportunity for self-care

Positive experience with meditation

Availability of the research team

View mindfulness as a fashionable

trendTime constraints

Personal characteristics

Training generated negative feel-

ings

Chunk 73

Training generated negative feel-

ings

Life circumstances

Environment not found suitable

View program as a stressor

Technology issues

Understanding of the program’s

structure

Unmet expectations

Belong to the control groupIncorporate periods of silence during

exercises

Reduce repetition of instructions

Provide option to pause and rewind

audio files

Increase the variety within the word-

ings

Include more rationale to support

mindfulness as a practice

Add psychoeducational content to

Chunk 74

Add psychoeducational content to
common feelings and experiences
in carers
Include additional short tutorial or
email to be able to contact course
leads
Stjernsward and Hans-
son (2018)Flexible and accessible interven-
tions
Improve coping skills
Opportunity for self-careTime constraint
Personal characteristics
Training generated negative feel-
ings
Life circumstances
View program as a stressorMore varied exercises and speaker
voices
Shorter daily training or longer test
period

Chunk 75

Shorter daily training or longer test

period

Clearer instructions

Easier navigation

Internet-independent application

Possibility to browse through the

exercises. 1267 Mindfulness (2024) 15:1257–1274

Study Characteristics

Study characteristics in the included studies are summarised

in Table 2. Three studies were published between 2017 and

2019 (Atreya et al., 2018 ; Stjernsward & Hansson, 2017 , 2018), with 6 studies published

since 2020 (Dragomanovich

Chunk 76

et al., 2021; Lange, 2020; Llaneza et al., 2022; Lunsky et al., 2021; Stjernsward & Hansson, 2020; Zarei et al., 2022). The studies were conducted in Canada (n = 2) (Lunsky et al., 2021; Zarei et al., 2022), the UK (n = 1) (Lange, 2020), Sweden (n = 3) (Stjernsward & Hansson, 2017, 2018, 2020), and the USA (n = 3) (Atreya et al., 2018; Dragomanovich et al., 2021; Llaneza et al., 2022). The sample sizes of studies ranged from 10 to 196 informal carers, whereby 2 stud-

Chunk 77

ies included informal carers and care recipients with a total number of 69 participants (Dragomanovich et al., 2021) and 53 (Atreya et al., 2018), respectively. Eight studies reported the mean age of participants, ranging between 50 and 65 years of age (Atreya, 2018; Lange, 2020; Llaneza et al., 2022; Lunsky et al., 2021; Stjernsward & Hansson, 2017, 2018, 2020; Zarei et al., 2022). Three studies included over 90% female participants (Llaneza et al., 2022; Stjernsward

Chunk 78

& Hansson, 2017, 2020), whereby participant relationship to the care recipient was reported in all studies, of which 4 studies involved a majority of spouse/partner relationship (Lange, 2020; Stjernsward & Hansson, 2017, 2018, 2020). Three of the nine included studies (Stjernsward & Hansson, 2017, 2018, 2020) had the same online MBI as they were part of one larger study. One study had an audio-based inter - vention (Atreya et al., 2018), whereas other studies had both

Chunk 79

audio/video and web interventions. One study did not report the daily practice requirement; however, it included 14 lev - els of mindfulness training (Llaneza et al., 2022). Length of practice times were between 10 and 20 min daily for the remaining studies. Apart from daily practice, 3 studies pro- vided weekly webinars for online MBI (Dragomanovich et al., 2021; Lunsky et al., 2021; Zarei et al., 2022) and + Reported when information available in the original studiesTable 3 (continued)

Chunk 80

Studies Enablers Barriers Suggestion for the program+

Stjernsward and Hans-

son (2017)Flexible and accessible intervention

Improve coping skills

Desire to help with research

Opportunity for self-care

Promote relaxation

Reduce anxiety

Availability of the research team

Positive experience with meditation

Better support for the care recipient

Use of mindfulness skills in daily

life Improve sleep

Relieve physical painTime constraint

Personal characteristics

Training generated negative feel-

ings

Chunk 81

Training generated negative feel-

ings

Life circumstances

Environment not suitable

View program as a stressorMore varied exercises

Partially “foreign” language (e.g.

compassion training, certain figures

of speech)

Incorporate periods of silence during

exercises

A longer program

Opportunity to discuss thoughts and

feelings

Zarei et al. (2022) Flexible and accessible intervention

Improve coping skills

Interventions addressed carers

needs

Helpful to be with other carers in

Chunk 82

needs

Helpful to be with other carers in

a groupTime constraints

Life circumstances

Fig. 2 Concept map illustrating relationships within and between the

descriptive subthemes and main themes 1268 Mindfulness (2024) 15:1257–1274

6 studies had practice dairies (Atreya et al., 2018 ; Lange,

2020; Stjernsward & Hansson, 2017, 2018, 2020; Zarei

et al., 2022). The duration of online interventions was 8

weeks for 6 studies (Atreya et al., 2018; Dragomanovich

Chunk 83

et al., 2021; Llaneza et al., 2022; Stjernsward & Hansson, 2017, 2018, 2020), 6 weeks for one study (Lunsky et al., 2021), and 4 weeks for another study (Lange, 2020).

Enablers of Online Mindfulness Practice

Three descriptive themes derived for enablers included (1) self-motivation, (2) positive experience of meditation, and (3) program structure and delivery.

Self-motivation

Self-motivation can be defined as a complex psychological process, involving how learners' subjective beliefs and

Chunk 84

perceptions impact on their choices, effort, and persistence in achieving their goals (Bakhtiar & Hadwin, 2022; Berliner & Calfee, 2004; Eccles & Wigfield, 2002). To provide better support for the care recipient was noted as a motivator to participate in online MBI in 3 studies (Atreya et al., 2018 ; Dragomanovich et al., 2021 ; Stjernsward & Hansson, 2017). To focus/train/organise thoughts was cited as an enabler to participate in 2 studies (Atreya et al., 2018; Dragomanovich

et al., 2021). Some participants joined the program due to their curiosity, whilst others participated to learn a new skill (Atreya et al., 2018; Dragomanovich et al., 2021). In one study, participants viewed mindfulness as a fashionable trend (Stjernsward & Hansson, 2020), thus prompting their participation. Three studies described the participants' desire to participate in the intervention being driven, in part, by a desire to support in research in carer wellbeing (Atreya et

Chunk 86

al., 2018; Stjernsward & Hansson, 2017, 2020). Some par - ticipants noted that participating in a research study with a deadline was a positive influence to continue with the inter - ventions (Stjernsward & Hansson, 2017).

Positive Experience of Mindfulness

Previous positive experience of meditation encouraged par - ticipants to undertake online MBI in 4 studies (Atreya et al., 2018; Lange, 2020; Stjernsward & Hansson, 2017, 2020).

Chunk 87

Participants from a study carried out to determine barriers and enablers of online mindfulness for informal carers of older adults with cognitive impairment reported that skills including breathing exercises, present moment awareness, and compassion helped them to reduce stress in their daily lives and thus encouraged adherence to online MBI programs (Llaneza et al., 2022). Some participants reported learning practical and meaningful skills from online MBI

Chunk 88

to empower them with better coping in the future (Lunsky et al., 2021). In addition, participants reported that having coping strategies available on their personal mobile device was helpful as they were able to access support right after a stressful period or at a regular scheduled time (Llaneza et al., 2022). In one study, participants experienced online MBI as a coping tool for stress, which in turn enhanced their wellbeing (Stjernsward & Hansson, 2017). They noted that they

Chunk 89

managed to reflect on a situation and not to be overwhelmed by strong emotions.

Participants also observed “thoughts come and go”, recognising the consequences of their actions, and choosing to either act upon or let go of a situation in a strategic way (Stjernsward & Hansson, 2017). Similar findings were reported in another study, where participants were more aware of their feelings and re-centred themselves using mindfulness exer -

Chunk 90

cises (Dragomanovich et al., 2021). The study was conducted to evaluate the feasibility and acceptability and estimate the efficacy of an 8-week online MBI program among informal carers of metastatic cancer patients. Participants in one study experienced reduced physical pain resulting from long-term stress when practicing online MBI, which in turn enhanced their health and wellbeing (Stjernsward & Hansson, 2017). In the same study, participants reported reduced anxiety. This

Chunk 91

study was conducted to explore the value and usability of an 8-week online MBI for informal carers of a person with mental and somatic health problems.

Four out of nine study participants experienced improved sleep, enabling them to continue practices (Atreya et al., 2018; Dragomanovich et al., 2021; Stjernsward & Hansson, 2017, 2018), whilst giving them an opportunity to self-care (Lange, 2020; Stjernsward & Hansson, 2017, 2018, 2020). Some par -

ticipants recognised the training as an opportunity to look after their own needs, considering this as a valid excuse to take time off from caring (Stjernsward & Hansson, 2020). Further, participants valued to be connected with others in similar situations (Lunsky et al., 2021; Zarei et al., 2022). Participants from a study carried out to evaluate the feasibility and effectiveness of online mindfulness among informal carer of people with dementia reported to continue using the

Chunk 93

program as it addressed their needs (Zarei et al., 2022).

Program Structure and Delivery

Seven out of nine studies reported flexible and accessible interventions as an enabler for participating in online MBI (Lange, 2020 ; Llaneza et al., 2022 ; Lunsky et al., 2021 ; Stjernsward & Hansson, 2017, 2018, 2020; Zarei et al., 2022). Interventions were available for the participants to access at their own convenience (Stjernsward & Hansson,

Chunk 94

2017). Participants noted that accessibility from home was
especially beneficial when home bound with care recipients.
Participants from another study also noted that having the
app in their personal device and being able to use it according
to their personal schedule, mood, and time preferences were
motivators of using the intervention (Llaneza et al., 2022).
Support from the research team members was reported

Chunk 95

as an enabler in 2 studies (Stjernsward & Hansson, 2017, 2020). Weekly email reminders with contact information for researchers for enquiries and technical support were motivators to continue the interventions (Stjernsward & Hansson, 2020). In one study, parents of adolescents and adults with autism noted a closed Facebook page as an enabler as it allowed them to access missed sessions and make connection with parents who have similar challenges (Lunsky et al., 2021).

Chunk 96

et al., 2021).

Barriers to Mindfulness Practices

Three descriptive themes derived for barriers included (1) lack of self-motivation, (2) external factors preventing par - ticipation, and (3) program structure and delivery.

Lack of Self-motivation

Lack of self-motivation was identified as a significant barrier to mindfulness practice in 6 studies (Lange, 2020; Llaneza et al., 2022; Lunsky et al., 2021; Stjernsward & Hansson, 2017, 2018, 2020). Reasons for lack of motivation included

Chunk 97

low mood, inability to focus, lack of interest in using the app (Llaneza et al., 2022), procrastination (Lange, 2020; Stjernsward & Hansson, 2017, 2020), forgetfulness, difficulty in establishing new habits (Stjernsward & Hansson, 2017, 2020), and a lack of self-discipline (Stjernsward & Hansson, 2017). Some participants also viewed the program as a stressor which hindered their participation (Lange, 2020; Stjernsward & Hansson, 2017, 2020). They reported being

Chunk 98

behind with the program schedule and struggling with daily chaos. Some participants reported MBI training as another stressful demand in their daily life, noting an inability to complete the training within the given schedule, which in turn generated stress for them (Stjernsward & Hansson, 2020). Similarly, unmet expectations from the program also negatively influenced participation in the program (Stjern-sward & Hansson, 2020).

External Factors Preventing Participation

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External Factors Preventing Participation

All studies identified external factors as barriers to participation (Atreya et al., 2018; Dragomanovich et al., 2021; Lange, 2020; Llaneza et al., 2022; Lunsky et al., 2021; Stjernsward & Hansson, 2017, 2018, 2020; Zarei et al., 2022). Life circumstances such as carers' health issues (Dragomanovich et al., 2021; Lange, 2020) and advanced age were indicated as barriers to participation (Lange,

Chunk 100

2020). All studies identified time constraints as a barrier.

These time constraints included health deterioration of the care recipient (Stjernsward & Hansson, 2020), providing

medical care (Dragomanovich et al., 2021), and support-

ing the daily activities including taking them to medical

appointments (Lange, 2020; Llaneza et al., 2022). Train-

ing that generated negative feelings was another barrier to

participation (Stjernsward & Hansson, 2017, 2018, 2020).

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Feelings such as anxiety and stress were identified as factors by one participant who was in crisis (Stjernsward & Hansson, 2020). Some participants noted that their environment was not suitable for training (Stjernsward & Hansson, 2017, 2020).

Program Structure and Delivery

Participants in 2 studies reported difficulty in understanding or following the program instructions (Atreya et al., 2018; Stjernsward & Hansson, 2020). Some participants had trouble understanding exactly

Chunk 102

what was expected of them, which induced a sense of insecurity as to whether they were doing the training properly and if they were gaining its benefits (Stjern-sward & Hansson, 2020). Two carers (n = 20) from another study reported that they had trouble understand -ing the instructions or content (Atreya et al., 2018). The study was conducted to assess feasibility, acceptabil-ity, and preliminary efficacy of an online MBI among patients with colorectal cancer and their informal car -

Chunk 103

ers. Technology issues were identified as a barrier in 4 studies (Atreya et al., 2018 ; Dragomanovich et al., 2021; Lange, 2020; Stjernsward & Hansson, 2020). One participant experienced computer problems with website issues and inaccessible content (Lange, 2020). This study investigated the feasibility and acceptability of online MBI comprising of 15 informal carers of stroke survivors (Lange, 2020). Belonging to the control group also acted as a barrier in one study, meaning partici-

pants had to wait long periods for exposure to the online MBI (Stjernsward & Hansson, 2020).

Relationship of Enablers and Barriers

Several concepts were identified for each of the enablers and barriers. These concepts were related to each other within and between the descriptive themes. Lack of self-motivation and external factors preventing participation can be interrelated due to their dependability with each other. For instance, care recipient illness may lead to procrastination in

Chunk 105

participating in online MBI. Program structure and delivery can positively or negatively be interrelated with remaining enablers and barriers. A conceptual map related to this is presented in Fig. 2. 1270 Mindfulness (2024) 15:1257–1274

Discussion

This review has identified the potential enablers and bar - riers to participating in an online MBI for informal carers. Though earlier reviews have synthesised evidence of some of these enablers and barriers among other populations

Chunk 106

(Guay et al., 2017; Linardon & Fuller-Tyszkiewicz, 2020; Marks et al., 2022; Winter et al., 2022), this review added to the existing knowledge by applying a systematic syn - thesis of evidence of enablers and barriers in all studies of online MBI specific to the informal carer population. The review identifies that online delivery of MBI programs can be a suitable mode to provide support for informal carers who may not be capable of attending face-to-face MBI programs.

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MBI programs.

This review identified self-motivation as an enabler for participating in online MBI. Similarly, previous studies have identified that carer motivation can be influenced by their perceptions, meanings and experiences, cultural values, beliefs, spiritual beliefs, illness beliefs, and socialisation (Zarzycki et al., 2023). This review revealed that previous positive experiences of mindfulness were a key enabler for participation in online MBI programs

Chunk 108

(Atreya et al., 2018; Lange, 2020; Stjernsward & Hansson, 2017, 2020). This finding is in keeping with a previous study conducted by Guay et al. (2017), which reported interventions tailored for behavioural change can have a positive effect on the psychological wellbeing of informal carers.

In contrast, identified barriers related to lack of self-motivation for participating in an online MBI have also been well documented in previous studies. Issues such

as individual characteristics, viewing the program as a stressor, and unmet expectations of the program were discussed. Some of these findings have been reported in a previous systematic review which investigated the engagement strategies to improve participant adherence and retention in online mindfulness programs. It was identified that participants with poorer psychological wellbeing were more likely to drop out and disengage with interventions

Chunk 110

(Winter et al., 2022). Another study also identified that rumination and worry can hinder the participant retention rate in online MBI (Banerjee et al., 2018).

Aligning with our findings, difficulty understanding the program structure has been reported as a barrier in a previous study of online MBI for cancer patients (Compen et al., 2017). Saleem et al. (2021), in their study of understanding engagement strategies in online interven-

Chunk 111

tions, suggested some mitigation strategies such as send-
ing reminders to participants, including colourful pictures,
visual content, large colourful icons, and easy-to-under -
stand content. Similarly, the broader literature has also identified negative effects of the training as a barrier for
MBI support (Britton et al., 2021; Taylor et al., 2022).
A systematic review was conducted to identify adverse
effects of meditation interventions and mind-body prac-

Chunk 112

tices, including 61 studies divided commonly reported negative effects from meditation interventions into 2 categories: mental distress and somatic distress (Taylor et al., 2022). Britton et al. (2021) have shown that MBI practices can be associated with transient distress and negative impacts on participants, with mild to severe levels of depression and persistently high levels of negative affect. Therefore, it is recommended that facilitators are aware of

Chunk 113

this risk and identify potential areas that require monitor -
ing and intervention to maximise the safety and efficacy
of MBI (Britton et al., 2021). Thus, creation of a strate -
gic approach and clear protocols for distress management
align with goals that are essential to safe interaction of
participants with online MBI (Taylor et al., 2022).
This review has identified the relationship between pro-
gram structure and delivery and external factors preventing

Chunk 114

participation (Fig. 2). Similar to our findings, previous studies have also identified competing priorities, programs not meeting participant needs, and lack of technical skills, time, and motivation (Boele et al., 2018; Moscato et al., 2019; Piil et al., 2015; van der Linden et al., 2018) as barriers to online MBI. It is also important to recognise here the relationship of sample characteristics for participating in web-based interventions including socio-economic background, educa -

tion, and perceived health, as they can impact the adherence (Wu et al., 2022).

It is well known that co-design and meaningful engagement of end-users at all aspects of intervention development impacts on the outcomes of a project (Slattery et al., 2020; Talevski et al., 2023). In the current review, 2 studies incorporated advisory committee input for developing online interventions (Atreya et al., 2018; Dragomanovich et al., 2021). Co-design of internet-based interventions is known

Chunk 116

to be complex, as it involves interaction between researchers, users, and software developers (Thabrew et al., 2018). However, this is a good strategy to employ when developing online MBI within the informal carer population. Carer peer groups can also be involved with online MBI development, as carers are more likely to connect with other carers to share their experiences and knowledge (Schirmer et al., 2022). Solutions created for informal carers need to be internally

motivating than decided for them (Hudson, 2013). Therefore, involving informal carers in the development process of online MBI may increase commitment to complete activities as they know what works best and what to include as they have lived experience of being a carer. Incorporating stakeholders to introduce online MBI and active governmental support for alternative interventions to improve health and

Chunk 118

wellbeing of informal carers are much needed. There is an opportunity for online MBI to be designed and adapted to meet the needs of informal carers, supporting access, and enabling their participation.

The integration of theoretical frameworks has been suggested when designing interventions to enhance retention rates of participants. One such framework is the Theoretical Domain Framework (TDF) (Michie et al., 2005), which

explores implementation problems, and seek to better under - stand behaviour-change processes in the application of evidence-based care (Francis et al., 2012). This framework is comprised of 12 key constructs relevant to changing the behaviour of consumers (Michie et al., 2005). The TDF has been widely used by health professionals and investigated for further application and key developments (Francis et al., 2012; Phillips et al., 2015; Sarmast et al., 2014). Identified

self-motivation and positive experience of mindfulness are related to one of the domains from the framework which is motivation and goals. Program structure and delivery and external factors preventing participation are related to envi - ronmental contexts and the resources domain (Michie et al., 2005). We have explored the relationships of the domains and how it impacts on participant engagement through the concept map in this study. Hence, the current review has so

far identified only two aspects of the TDF. This acknowledgement could lead to future studies investigating the influence of the relationship between remaining domains.

Limitation and Future Research

There are some limitations to this review. We acknowledge that there were limitations of the terms used; however, we consulted with a health librarian to ensure that the current search terms provided an exhaustive approach to our search

Chunk 122

strategy. As a result, a comprehensive search was conducted across ten databases in total: eight health databases and two comprising grey literature. A hand search of relevant literature was also conducted. Due to the dearth of literature exploring the enablers and barriers of MBI for informal carers, no study was excluded during appraisal of methodological quality. Secondly, the findings were mainly qualitative as data were mainly extracted from qualitative findings, free

text answers, and recruitment. Program attrition rate was varied between studies and high attrition was noted in most studies. This was also a limitation when interpreting findings. To establish trustworthiness, the research process was reported in detail. To enable transparency and to preserve the context for the evaluation of the reader, each study was reported in detail, according to the aim, participants, online intervention, data collection, analysis, findings, and com -

Chunk 124

ments related to enablers and barriers.

This systematic review has explored and synthesised evi-

dence to provide a comprehensive understanding of enablers

and barriers of online MBI for informal carers. The findings provide evidence of the enablers and barriers that should be

considered when developing online MBI for informal car -

ers to promote their participation. Developing co-designed

carer-focused online MBI interventions is of vital impor -

tance to reduce the carer burden and enhance carer wellbeing. The effects of the identified enablers and barriers to participation in online MBI should be further researched. This would provide further evidence about enablers and barriers by engaging stakeholders in the process, so that programs can be developed in response to the needs of informal carers and promote their engagement with these interventions.

Supplementary Information The online version contains supplemen-

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tary material available at https:// doi. org/ 10. 1007/ s12671- 024- 02365-y .

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