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Effets des interventions de gratitude sur la santé des patients : une étude de la portée

THESE D'EXERCICE EN MEDECINE

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Par

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Et

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Sous la direction de

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Je promets et je jure d'être fidèle aux lois de l'honneur et de la probité dans l'exercice de la Médecine.

Je respecterai toutes les personnes, leur autonomie et leur volonté, sans discrimination.

J'interviendrai pour les protéger si elles sont vulnérables ou menacées dans leur intégrité ou leur dignité. Même sous la contrainte, je ne ferai pas usage de mes connaissances contre les lois de l'humanité.

J'informerai les patients des décisions envisagées, de leurs raisons et de leurs conséquences. Je ne tromperai jamais leur confiance.

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Que les hommes m'accordent leur estime si je suis fidèle à mes promesses. Que je sois couvert d'opprobre et méprisé si j'y manque.

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Effets des interventions de gratitude sur la santé des patients : une étude de la portée

Résumé

Contexte: Les médecins généralistes font face à un nombre croissant de patients en demande de prise en charge en santé mentale. Les interventions non pharmaceutiques en soins primaires, telles que la prescription d'exercices stimulant le sentiment de gratitude, semblent être une alternative ou un complément aux traitements pharmaceutiques des troubles mentaux les plus courants.

Objectif: Une scoping review ou étude de la portée a été réalisée pour décrire l'étendue des connaissances et des preuves disponibles sur les interventions de gratitude, clarifier les concepts clés, identifier les lacunes de connaissance et décrire les applications pratiques de la gratitude en santé.

Méthodes: Des recherches ont été effectuées sur les bases de données MEDLINE, Web of Science, Embase et PsycInfo en mai 2023 afin d'identifier les études pertinentes, qui ont été analysées conformément aux directives de l'extension PRISMA pour les revues de la portée.

Résultats: 81 études ont été incluses. L'Amérique du Nord semble être le continent le plus représenté, contribuant à 45.7% des études incluses. La forme prédominante d'intervention de gratitude impliquait l'utilisation de journaux ou de listes de gratitude. Les participants à ces études provenaient majoritairement d'un haut milieu socioculturel et étaient principalement de sexe féminin. Les critères de jugement étudiés étaient plutôt psychologiques que physiques.

Conclusion : Les interventions de gratitude semblent être un outil prometteur en termes de prévention. De futures recherches sont à mener sur l'utilisation de la gratitude en soins primaires et en milieu hospitalier, impliquant d'autres professionnels de santé, dont les médecins généralistes.

Introduction de la thèse

Les médecins généralistes, en première ligne des soins primaires, observent une augmentation significative des consultations liées à des troubles psychiques tels que l'anxiété, la dépression, les difficultés relationnelles ou la souffrance au travail (33). En parallèle, les patients expriment de manière croissante le besoin de renforcer une prise en charge globale, intégrant la définition bio-psycho-sociale de la santé. Dans ce contexte, il existe une volonté de renforcer la prévention et les alternatives non médicamenteuses lorsque cela est possible (17).

Des interventions telles que l'activité physique, l'écoute de la musique et la cohérence cardiaque ont démontré des effets bénéfiques sur la santé des patients (92)(29). Les avantages en sont un coût réduit, une mise en œuvre rapide et un risque limité d'effets secondaires.

La gratitude est définie dans le langage courant comme « un sentiment de reconnaissance pour un service, pour un bienfait reçu, un sentiment affectueux envers un bienfaiteur » (60). Afin d'entretenir ce sentiment, selon R. Emmons et M. McCullough, chercheurs en psychologie, « la gratitude nécessite la reconnaissance du bienfait, l'intention bienveillante du donateur et la perception que le don est offert sans contrepartie » (88). La gratitude nécessite donc de repenser le rapport à l'autre et d'aller vers autrui. C'est une émotion engageant à la fois la capacité intellectuelle de reconnaissance et la dimension émotionnelle d'appréciation.

La gratitude en tant que déterminant de santé a connu un essor avec l'avènement de la psychologie positive en 1998 et les travaux de M. Seligman, chercheur en psychologie (86). Les études menées au XXe siècle s'interrogeaient davantage sur la compréhension des mécanismes psychopathologiques des troubles de l'humeur ou anxieux. La psychologie positive explore quant à elle les facteurs qui participent à rendre les patients plus résilients, heureux ou optimistes comme la joie, le bonheur ou le bien-être avec une utilisation thérapeutique (85).

Des études récentes indiquent que les individus exprimant davantage de gratitude ont tendance à avoir un bien-être subjectif plus élevé (39)(57). Si la gratitude peut se ressentir comme une brève émotion, son expression de manière durable s'apparente à une humeur et peut jouer un rôle sur les processus cognitifs, les comportements et les réactions physiologiques (65).

Les effets de la gratitude s'étendent au-delà du domaine mental. Par exemple, la gratitude a montré un effet significatif sur le sommeil. Elle permet de réduire les pensées négatives avant le

coucher. Les risques d'insomnie et de dépression sont diminués. Les performances scolaires ou sportives sont améliorées (47). Des études récentes suggèrent son rôle en faveur d'un meilleur contrôle glycémique et une diminution des marqueurs inflammatoires (83)(79).

Sur le temps long, la gratitude devient un trait de personnalité. Sa pratique quotidienne participerait à améliorer le bien-être durablement en augmentant certaines capacités d'un individu.

Elle permet de développer son aptitude à tisser un réseau social ou à rechercher des soutiens. La gratitude favorise la résilience d'un individu, capable de s'accepter tel qu'il est et de définir des objectifs de vie clairs (28).

Les interventions qui permettent de stimuler la gratitude chez les patients sont diverses. Il peut s'agir d'un journal, d'une application mobile, d'une liste de gratitude ou d'une lettre de gratitude. Ces outils permettent d'identifier des éléments positifs du quotidien du patient. Il existe donc un intérêt potentiel pour la santé à pratiquer la gratitude. Les interventions portant sur la gratitude présentent-elles un intérêt dans la pratique des médecins généralistes ?

Le nombre d'études sur ce sujet est en augmentation. Des lacunes existent quant à la compréhension des méthodologies de recherche et des interventions utilisées.

Quels sont les effets sur la santé des patients à qui sont prescrits des outils stimulant la gratitude ?

Une scoping review ou étude de la portée a été réalisée pour décrire l'étendue des connaissances et des preuves disponibles sur les interventions de gratitude, clarifier les concepts clés, identifier les lacunes de connaissance et décrire les applications pratiques de la gratitude en santé.

L'article est rédigé en anglais dans un objectif de publication.

Effects on Health of Gratitude Interventions: A Scoping Review

Abstract

Background: General practitioners (GPs) are encountering a rising number of patients seeking mental health assistance. Non-pharmaceutical interventions in primary care, such as prescribing gratitude exercises, offer an alternative or supplementary option to pharmaceutical treatments for common mental illnesses. Consequently, it appears crucial to present a research article focused on gratitude interventions to deepen our understanding of this approach.

Aim: A scoping review was conducted to map the breadth of evidence available about gratitude interventions, clarify the key concepts, identify knowledge gaps, and outline the practical applications of gratitude interventions.

Methods: Searches were performed on MEDLINE, Web of Science, Embase and PsycInfo in May 2023 to identify relevant studies, which were analyzed according to PRISMA extension for scoping reviews guidelines. To be included in the review, papers needed to focus on gratitude interventions and their effects on health (physical, emotional, social, spiritual or intellectual). We considered articles published in English, French, Spanish and Portuguese languages.

Results: 81 studies were included after applying the exclusion criteria. Northern America emerged as the most represented continent, contributing to 45.7% of the studies. The predominant form of gratitude intervention involved the use of gratitude diaries or lists. We notice a rise in internet-based interventions, constituting 21% of the interventions. The participants in these studies were frequently highly educated and predominantly female. The focus of the studies leaned more towards psychological outcomes rather than physical outcomes.

Conclusion: Gratitude interventions appear promising as tools for prevention. Future research should focus on primary care practices and hospitals, involving healthcare professionals, including general practitioners. Key messages underscore the necessity of informing health professionals about the effectiveness of gratitude interventions, encouraging greater participation from males and older individuals in future studies.

1. Introduction

General practitioners (GPs) are facing an increasing demand for mental health support among their patients, as reported instances of anxiety, depression, and work-related stress rise in primary care settings (3). Non-pharmaceutical interventions in primary care are gaining significance as alternatives to traditional pharmaceutical treatments, particularly when addressing the holistic needs of patients with both physical and mental health concerns (4).

This article explores the potential of Positive Psychology Approaches (PPAs) with a specific focus on gratitude interventions to enhance patient well-being. Positive Psychology, introduced by Martin E.P. Seligman in 1998, explores the study of individual faculties that empower human beings to be more resilient and optimistic in the face of life's challenges (75). Gratitude, as a theme in PPAs, has demonstrated effectiveness in improving social or mental outcomes (39)(57). Notably, gratitude interventions present minimal negative side effects, require less setup time, and are cost-effective (96).

In the context of primary care, gratitude interventions emerge as valuable tools for general practitioners, serving as preventive measures or complementary treatments. These interventions can take various forms, such as journaling, letter-writing, gratitude lists or the utilization of mobile applications (59). Emerging studies even suggest potential physical effects of gratitude, impacting areas such as sleep quality, inflammatory responses, and cardiac outcomes (47)(65).

However, despite the growing body of evidence supporting the utility of gratitude interventions in enhancing patient health, there remains a notable gap in understanding whether they could be a potential tool to add to the general practitioner toolkit. To address this, a scoping review was undertaken to elevate the level of knowledge and provide a current overview of the effects of gratitude interventions on health.

This review aims to provide a comprehensive mapping of available evidence, including synthesizing key concepts and identifying knowledge gaps.

2. Methods

2.1 Protocol and Registration

A protocol was drafted using the Preferred Reporting Items for Systematic Reviews and Meta-analysis Protocols extension for scoping reviews (PRISMA-Scr), which was revised by the research team. The final protocol was registered prospectively with the Open Science Framework on 26 May 2023 (<https://osf.io/d52nu>).

2.2 Eligibility Criteria

To be included in the review, papers needed to focus on gratitude interventions and their effects on health (physical, emotional, social, spiritual or intellectual). We considered articles published in English, French, Spanish and Portuguese languages. We did not exclude papers based on their publication date.

However, papers were excluded if they combined positive psychology interventions, creating difficulty in discerning whether the outcomes stemmed from a gratitude intervention or another positive psychology intervention (such as mindfulness or acts of kindness).

Our emphasis was on articles featuring a gratitude intervention, thereby excluding those that assessed trait gratitude through questionnaires and linked it to other outcomes, without implementing any intervention. We refrained from incorporating protocols or unpublished papers in our review, excluding gray literature from our analysis. Upon excluding protocols, we conducted a search to ascertain whether the study had been published. If published, we proceeded to include it in our review. We only kept articles, therefore excluding books or theses.

2.3 Information Sources

To identify potentially relevant documents, the following bibliographic databases were searched in May 2023: MEDLINE, Web of Science, Embase and PsycInfo. The search strategies were drafted by an experienced librarian and further refined through team discussion. The final search results were exported into Zotero, and duplicates were removed by the two main researchers (MD, VC).

2.4 Search

To search databases, the research algorithm was modified to fit each database search system. The following algorithm for MEDLINE was used as a basis for other searches. It was designed to be sensitive, using broad keywords:

```
((gratitude intervention*[Title/Abstract]) AND (((effect*[Title/Abstract]) OR (result*[Title/Abstract])) OR (benefit*[Title/Abstract])) OR ("action of"[Title/Abstract])) OR (efficac*[Title/Abstract])) AND ((health [MeSH Terms]) OR (health*[Title/Abstract]))
```

The final search strategy for Web of science, Embase and Psycinfo can be found in Additional file 1.

2.5 Selection of Sources of Evidence

Studies found with our research algorithm were sorted by two different investigators in an independent manner, and results were compared afterwards. We selected studies first based on titles and abstract. Then, if needed, studies were read in their entirety to search for eligibility.

Disagreements in study selection could be resolved by a third and fourth investigators (FZ and SS), that were not involved in the study selection and data extraction process. However, disagreements could all be resolved by consensus between the two main reviewers, and external investigators did not need to intervene.

2.6 Data Charting Process

To extract the relevant information from the included sources of evidence, a data-charting form in Excel was jointly developed by the four reviewers, to determine which variables to extract. A calibration procedure was conducted, to identify any inconsistencies in the data charting process, during which the two primary reviewers (MD, VC) independently charted data from the initial ten selected studies, The entire procedure was overseen by the two additional reviewers (FZ, SS), who scrutinized the data charting for any discrepancies.

The subsequent articles were then analyzed by the two primary reviewers, who each extracted data in an independent manner. Any disagreements that arose were resolved through discussion among the reviewers.

2.7 Data Items

We abstracted data on article characteristics (e.g., country of origin, year of publication, funder, conflict of interest, study design), participants characteristics, the type of gratitude intervention used and which provider was responsible for the intervention, the facility where participants were recruited, gratitude measurement tools used, the primary outcomes and main findings of the studies etc.

2.8 Critical Appraisal of Individual Sources of Evidence

As our scoping review was conducted to provide an overview of the existing evidence on gratitude, regardless of methodological quality or risk of bias, we did not include a critical appraisal of the individual sources of evidence included in our study.

2.9 Synthesis of Results

We grouped the studies by type of gratitude intervention, as well as by the primary outcomes analyzed. Where we identified a systematic review, we counted the number of studies included in the review that potentially met our inclusion criteria and noted how many studies had been missed by our search.

3. Results

3.1 Characteristic of the included studies

The search strategy yielded 751 references. After applying the selection criteria, 81 publications were deemed eligible for inclusion in the review (Figure 1). Most publications originated from North America (n=37, 45.7%), followed by Europe (n=17, 20.9%), and Asia (n=15, 18.5%). The number of publications demonstrated a steady increase from 2008 onwards. Randomized controlled trials were the most frequently utilized study design (n=48, 59.2%). A substantial portion of the studies (n=29, 35.8%) focused on participants who were children, young adults, or students. Additionally, a predominant proportion of participants in the included studies were female.

Figure 1: PRISMA Flow diagram of study selection process

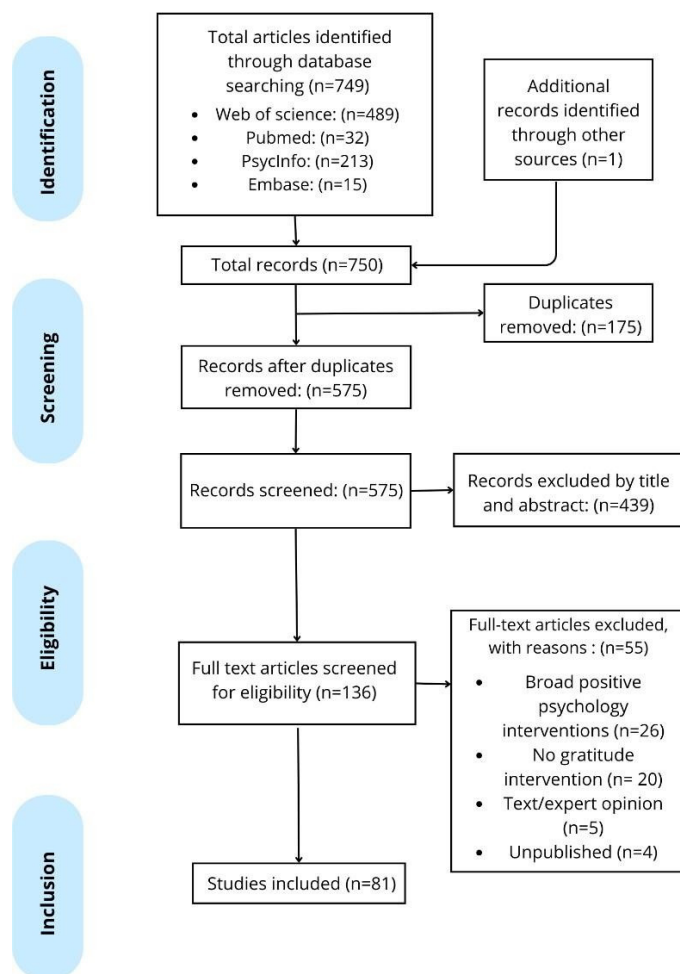


Table 1: Characteristics of included studies

CHARACTERISTIC	NUMBER OF STUDIES, N (%)
STUDY DESIGN	
Randomized controlled trial	48 (59.2)
Pre-post study	12 (14.8)
Mixed methods	5 (6.1)
Systematic review of literature	4 (4.9)
Quasi-experimental study design	3 (3.7)
Qualitative study	2 (2.5)
Prospective cohort study	2 (2.5)
Scoping review	1 (1.2)
Post-test only design	1 (1.2)
Brief report	1 (1.2)
Two factor design study	1 (1.2)
Interventional stepped-wedge cluster design study	1 (1.2)
ORIGIN OF STUDY	
North America	37 (45.7)
Europe	17 (20.9)
Asia	15 (18.5)
Middle East	3 (3.7)
Oceania	3 (3.7)
Mixed continents	3 (3.7)
Africa	2 (2.5)
South America	1 (1.2)
YEAR OF STUDY COMPLETION	
From 2020 to 2023	33 (40.7)
From 2017 to 2019	29 (35.8)
From 2014 to 2016	9 (11.1)
From 2011 to 2013	8 (9.9)
From 2008 to 2010	2 (2.5)
STUDY POPULATION	
Children, Young, Students	29 (35.8)
General population	10 (12.4)
Psychiatric disease	9 (11.1)
Physical disease	8 (9.9)
Family or teacher of patient	6 (7.4)
Women	5 (6.2)
Health care workers	4 (4.9)
Employees workers	4 (4.9)
Old	3 (3.7)
Non applicable (systematic review)	2 (2.5)

CHARACTERISTIC	NUMBER OF STUDIES, N (%)
FACILITY	
External	64 (79.0)
Hospital	10 (12.4)
Non applicable (systematic review)	5 (6.2)
Unspecified	2 (2.5)
PROVIDER	
Researchers	70 (86.4)
Teachers	5 (6.2)
Facilitators, lay providers	3 (3.7)
Unspecified	2 (2.5)
Nurses	1 (1.2)
DEFINITION OF GRATITUDE	
Mixed definitions	32 (39.5)
Not reported	25 (30.9)
Wood et al. (2010)	8 (9.9)
Emmons and McCullough (2003)	6 (7.4)
Lambert et al.(2009)	2 (2.5)
McCullough et al. (2001)	1 (1.2)
Park et al. (2006)	1 (1.2)
Emmons and Crumpler (2000)	1 (1.2)
Bono et al. (2004)	1 (1.2)
GRATITUDE QUESTIONNAIRES USED	
GQ-6	38 (46.9)
None	30 (37.0)
GAC	6 (7.4)
Other methods	4 (4.9)
GRAT	4 (4.9)
Non applicable (reviews)	3 (3.7)
TYPE OF INTERVENTION	
Gratitude writing only (journal or list of gratitude)	39 (48.2)
Gratitude web interventions, email or mobile app	17 (21.0)
Specific gratitude programs	10 (12.3)
Group interventions, interview or gratitude visits	8 (9.9)
Systematic review of literature	5 (6.2)
Gratitude visualizations	1 (1.2)
Gratitude thinking only interventions	1 (1.2)
Gratitude audio interventions	1 (1.2)
DURATION OF INTERVENTION	
< 4 weeks	43 (53.0)
4-12 weeks	33 (40.7)
NR or non-applicable (reviews)	5 (6.2)

CHARACTERISTIC	NUMBER OF STUDIES, N (%)
MAIN OUTCOMES	
Only psychological	66 (81.5)
Psychological and physical	8 (9.9)
Psychological and work-related	4 (4.9)
Non applicable (reviews)	3 (3.7)
CONFLICT OF INTEREST	
No COI declared	53 (65.4)
Unspecified	26 (32.1)
COI declared	2 (2.5)
FUNDINGS	
Unspecified	41 (50.6)
Fundings declared	29 (35.8)
No fundings declared	11 (13.6)

Table 2: Study design, year, country and population

Study	Year	Country	Population	Sample N	Age (years + SD)	Females N (%)
Fekete et al.	2022	USA	General Population during the COVID-19 pandemic	79	40.86 (17.4)	68 (86.08 %)
Caragol et al.	2021	USA	Primary care clinicians	30	NR	23 (77.4%)
Bono et al. (1)	2020	USA	Students in high school	327	14.7 (NR)	186 (57%)
Duthely et al.	2017	USA	Middle school adolescents	55	NR	32 (58%)
Schache et al.	2019	New Zealand	Adolescents with type 1 diabetes	80	12.2 (1.8)	32 (53.3%)
Redwine et al. (1)	2016	USA	Stage B heart failure patients	70	66.2 (7.6)	12 (17.1%)
Davies et al.	2021	USA	Women with weight bias internalization	135	20.8 (2.9)	135 (100%)
Boggiss et al.	2020	New Zealand	NA	2301	NR	NR
Li et al.	2021	China	HIV-positive men who have sex with men (HIVMSM)	404	NR	0 (0%)
Dunaev et al.	2018	USA	Young adults with weight bias internalization	369	22.7 (2.1)	189 (51.2%)
Winslow et al.	2016	USA	Employees in a social services agency	92	46.6 (12.3)	85 (92.4%)
Kloos et al.	2022	Netherlands, Belgium	Adults who felt they suffered from reduced well-being due to the COVID-19 crisis	849	53 (15)	677 (80%)
Geraghty et al.	2010	UK	Spontaneous adult users	479	36 (10)	458 (95.6%)
Neumeier et al.	2017	Australia, Germany	Adult employees	303	41.2 (12.3)	203 (67.0%)
Wong et al. (1)	2016	USA	Adults seeking university-based psychotherapy services	293	22 (5)	190 (65%)
Lindauer et al.	2021	USA	Hospitalized adult medical patients	91	56.3 (15.4)	52 (57.1%)
Cousin et al.	2020	USA	NA	3 824	NR	NR
Kim-Godwin et al. (1)	2020	USA	Parents of teenagers or adult children with emotional and/or behavioral problems	37	55.3 (8.2)	35 (94.6%)
Jung et al.	2017	South Korea	Chronic schizophrenic patients	32	40.9 (NR)	8 (25%)
Bai et al.	2019	China	Women with infertility	234	30.3 (NR)	243 (100%)
Renshaw et al. (1)	2017	USA	College students	97	19.9 (NR)	78 (80.4%)

Study	Year	Country	Population	Sample N	Age (years + SD)	Females N (%)
Komase et al. (1)	2019	Japan	Employees	145	42 (NR)	70 (48.3%)
Ganz et al.	2022	USA	General Population	45	41.3 (NR)	21 (46,7%)
Komase et al. (2)	2021	Japan	Workers (Mainly Health care professionals)	10 850	NR	NR
Hatori et al.	2019	Japan	College students	62	20.63 (1.53)	39 (62.9%)
Heckendorf et al.	2019	Germany	People with high Repetitive negative thinking (RNT)	262	42.2 (10.9)	154 (58.8%)
Cyzowska et al.	2022	Poland	Young Adults	80	20.925 (2,06)	56 (70 %)
O'Connell et al. (1)	2017	Ireland	University students	91	23.61 (7.79)	53 (58.2%)
Moieni et al.	2018	USA	Healthy women	76	42.6 (4.8)	76 (100%)
Renshaw et al. (2)	2017	USA	College students	115	20.56 (1.92)	95 (82.6%)
O'Connell et al. (2)	2017	USA	General Population	192	27.08 (12.63)	129 (67.2%)
Schnitker et al.	2018	USA	Undergraduate students	196	18.35 (0.42)	173 (88.4%)
Wong et al. (2)	2017	USA	College students	20	22.50 (3.76)	14 (70%)
Timmons et al.	2018	USA	Mothers of children with autism spectrum disorder	82	39.70 (6.92)	82 (100%)
Bartlett et al.	2019	USA	Older adults	42	73 (6.43)	34 (80%)
Bohmeijer et al. (1)	2022	Netherlands	General Population	169	48.7 (9.4)	152 (89.9%)
Adair et al. (1)	2020	USA	Health Care Workers	1575	1 100 (69.84%)	NR
Aparicio et al.	2018	Spain/Canada/UK	Patients and their families and health professionals	NR	NR	NR
Fritz et al	2018	USA	Adolescents and young adults	S1: 327 S2: 1017	S1: 19 (1.3) S2: NR	S1: 249 (76%) S2: NR
He et al.	2022	China	Adolescents	275	16.53 (1.15)	111 (40.36 %)
Valdez et al.	2021	Philippines	High school students	110	14.75 (1.16)	70 (63.64 %)
Cregg et al.	2021	USA	People with depression and anxiety	3675	32 (NR)	NR
Lau et al.	2011	China	Older adults	83	62.7 (7.13)	50 (60.0%)

Study	Year	Country	Population	Sample N	Age (years + SD)	Females N (%)
Carter et al.	2018	UK	School children	S1: 606 S2 : 92	S1: 9.82 (0.73) S2 : 9.60 (0.94)	S1 : Gender ratio of approximately 1:1. S2 : 57 (61.96 %)
Du Plessis et al.	2020	South Africa	University Students	933	19.95 (NR)	709 (76%)
Chun et al.	2013	USA	Patients who suffered traumatic spinal cord injury	15	34 (NR)	5 (25%)
Chang et al.	2022	USA	Couples	272	27.07 (9.85)	136 (50%)
Cheng et al.	2015	China	Health care practitioners	125	NR	69 (55%)
Kim-Godwin et al. (2)	2020	USA	Mothers of teenagers or adult children with emotional and/or behaviors problems	34	55.18 (8.01)	34 (100%)
Ghandeharioun et al.	2016	USA	Students	Round 1: 15 NS Round 2: 27		Round 1: 7 (46,67%) Round 2: 14 (51.85%)
Toepfer et al.	2011	USA	University students	219	25.7 (11)	188 (85.84%)
Smyth et al.	2012	UK, Irland	Healthy women	30	26 (3.8)	30 (100%)
Stivastava et al.	2023	India	Youth	80	NR	34 (42.5%)
Salzmann et al.	2018	Germany, Austria	General Population	72	23,84 (NR)	34 (47,22%)
Otsuka et al.	2012	Japan	Workers	38	48.5 (4.6)	9 (23.7)
Carson et al.	2010	UK	Service users attending a community mental health team	9	NR	NR
Cunha et al.	2019	Brazil	General Population	410	32.73 (10,72)	317 (77,3%)
Bohlmeijer et al. (2)	2020	Netherlands	People with low to moderate well-being and moderate distress	217	48.6 (9.6)	195 (89.9%)
Arps et al.	2018	New Zealand	Young adults	136	18.09 (1.7)	116 (85%)
Armenta et al.	2022	USA	High-school students	200	15.11 (NR)	NR
Ika et al.	2017	Indonesia	Teachers for children with Special Educational Needs (SEN)	47	NR	24 (51.1%)
Venturo-Conerly et al.	2022	Kenya	Adolescents in low-income regions	895	16.00 (1.44)	454 (50.95%)

Study	Year	Country	Population	Sample N	Age (years + SD)	Females N (%)
Peters et al.	2013	Netherlands	College students	82	22.8 (6,4)	69 (84.15%)
Khanna et al.	2021	India	School students	237	12.31 (1.27)	85 (36,9%)
Oltean et al.	2022	Romania	General Population	237	27.22 (8.758)	198 (83.5%)
Berger et al.	2019	Israel	General Population	210	M 26.69 (3.57)	151 (71.9 %)
Shin et al.	2018	USA	Asian and White American emerging adults	581	20.25 (1.47)	463 (79.69 %)
Gabana et al.	2020	USA	Youth athletes	18	16.6 (1.10)	18 (100%)
Karns et al.	2017	USA	Healthy young women	33	21 (2)	33 (100%)
Atad et al.	2021	Israel	Undergraduate students	448	28.5 (8.6)	251 (56%)
Krentzman et al	2014	USA	Individuals in treatment for an alcohol use disorder	23	NR	NR
Isik et al.	2017	Turkey	College students who showed signs of stress and difficulty in adjustment.	21	18.19 (2.47)	14 (66.67%)
Senf et al.	2012	Malaysia	Undergraduates students	122	20.3 (1.63)	86 (70.49%)
Jackowska et al.	2016	UK	Healthy women	119	26.26 (NR)	119 (100%)
Geier et al.	2022	USA	College students	87	NR	39 (44.8%)
Oliveira et al.	2021	Portugal, Brazil	General Population	533	40.15 (15.64)	382 (71.67%)
Pearson et al.	2021	UK	People with dementia	5	74 (NR)	3 (60%)
Adair et al. (2)	2020	USA	Healthcare workers	S1 : 275 S2 : 123 S3 : 123	NR	S1 : 227 (82.5%) S2 : NR S3 : 109 (88.6%)
Killen et al.	2015	UK	60 years and older adults	88	70.84 (7.51)	65 (73.9%)
Layous et al.	2016	USA	College students	S1 : 233 S2 : 139	S1 : 20.02 (2.92) S2 : 19.60 (3.10)	S1 : 162 (69.6%) S2 : 105 (75.5%)
Kaczmarek et al.	2013	Poland	College students	226	21.36 (1.66)	161 (71.2%)

Table 3 : Detailed description and findings of the selected studies

Study	Intervention description	Duration	Main Outcomes	Summary of findings
Fekete et al.	Online gratitude writing intervention for a total from 5 to 10 minutes every day. Write about things in their life, both large and small, that they were grateful for. In addition, participants were instructed to identify previously unappreciated aspects of their life that they were grateful for, including situations over the past week that were particularly meaningful or important.	1 week	Gratitude levels Psychological distress Positive and negative affect	The gratitude writing group maintained gratitude levels and decreased stress and negative affect at one month post-intervention.
Caragol et al.	In-person 90-minutes group psychoeducation and skills-building workshop (1. Didactic material from a literature review on stressors affecting clinician wellbeing and a didactic on gratitude. 2. Guided experiential exercises for clinicians to learn skills in developing a regular gratitude practice. 3. Explanation of the daily gratitude journal exercise), followed by a daily gratitude journal exercise.	8 weeks	Stress Coping self-efficacy Clinician autonomy Career satisfaction Self-care behaviors	The intervention was brief, feasible, and of interest to clinicians. Statistically significant improvements were seen in most outcome measures at both 4 and 8 weeks follow-up, with the exception of gratitude, which also increased, but not significantly so. Gratitude categories mentioned most frequently were support platforms at work (47%) and sense of competence (42%).
Bono et al. (1)	Psychoeducational top-down technique combined with a bottom-up Social-Media-App modality that supports the autonomous practice of interpersonal and general gratitude.	6 weeks	Gratitude Positive and negative affect, Prosociality and altruism Life satisfaction, Friendship satisfaction Improvements in anxiety	Students in gratitude intervention classes demonstrated improved outcomes in trait gratitude, mental health, and personal/social wellbeing after 6 weeks. Students' use of the app also demonstrated more grateful personality behaviors and personal engagement. Expressing thanks contributed to improvements in social emotional learning competencies among waitlist/control students 6 weeks later.
Duthely et al.	A novel intervention, which fused the practice of meditation with Gratitude Visualizations for 10 sessions, lasting between 15 and 20 minutes. Participants were instructed breathing and relaxation exercises, concentration techniques, and visualization techniques. Utilizing objects to focus on, participants practiced different concentration techniques. During each session, the group also repeated in unison one or more aphoristic poems on the themes of peace or serenity, quieting the thoughts, and gratitude. Participants were encouraged to practice at home in between study sessions.	4 weeks	Life satisfaction School satisfaction Measured gratitude	The intervention significantly affected life satisfaction, school satisfaction, and gratitude of the experimental group, when compared to the control group.
Schache et al.	A Gratitude Journaling intervention. Participants were asked to write down three things they were grateful for every day. The heading on each page of the journal read 'Today I am thankful for:' and had three lines underneath for adolescents to write down anything they wanted. Additionally, the pages were labelled with each day of the week, serving as a cue to action.	8 weeks	Stress Glycemic control (HbA1c) Quality of life Self-care Depression Gratitude	There was no evidence of any between-group differences in the psychological or behavioral measures at follow-up (all P-values > 0.05). While HbA1c remained stable during the 12 weeks in the gratitude group, HbA1c increased in the control group (P = 0.048). Participants who adhered to the gratitude intervention had a greater improvement in HbA1c compared with those who were less adherent.
Redwine et al.	A daily Gratitude Journal Diary with instructions: "For the next eight weeks you will be asked to record 3-5 things for which you are grateful on a daily basis".	8 weeks	Gratitude Resting heart rate variability (HRV) Inflammatory biomarker index	The gratitude intervention was associated with improved trait gratitude scores, reduced inflammatory biomarker index score over time and increased parasympathetic heart rate variability responses during the gratitude journaling task, compared with treatment as usual. However, there were no resting pre- to post-intervention group differences in HRV.
Davies et al.	"Expand Your Horizon" A body Gratitude Journaling intervention that helps individuals change how they see their body and develop appreciation for their body's functions. The first video included an introduction describing the importance of functionality appreciation and a list of examples of different body functions. Each of the subsequent videos asked participants to focus on a different component of body functions and consider why these functions are personally important to them.	1 week	Weight Bias Internalization Functionality appreciation Self-compassion Healthcare stress	Participants in both conditions experienced improvements in weight bias internalization, functionality appreciation, and self-compassion at follow-up, though improvements were greater in the Expand Your Horizon condition. Further, participants in the Expand Your Horizon had greater improvement in healthcare stress at follow-up.

Study	Intervention description	Duration	Main Outcomes	Summary of findings
Boggiss et al.	<p>1*: gratitude intervention 1h sessions each week and 3 daily gratitude journal prompts</p> <p>2*: gratitude intervention listing three things to be grateful for</p> <p>3: gratitude intervention recording at least 5 entries per week of people, place, things, circumstances for which they were grateful</p> <p>4: gratitude intervention journaling about a recent or anticipated positive event daily</p> <p>5: gratitude intervention writing a list of five things they were grateful for weekly</p> <p>6: gratitude intervention writing a list of five things they were grateful for daily</p> <p>7: gratitude intervention writing a list of five things they were grateful for</p> <p>8: gratitude intervention listing five things they were grateful for five times a week</p> <p>9*: gratitude intervention combining an weekly online gratitude training with a daily mobile gratitude app</p> <p>10: gratitude intervention listing things they were grateful for about their job at least three times per week</p> <p>11*: gratitude intervention journaling about previously unappreciated people and things in their lives</p> <p>12: gratitude intervention listing three things to be grateful for</p> <p>13: gratitude intervention listing five things to be grateful for</p> <p>14* : gratitude intervention with different prompts given once a week and participants were asked to review their writing later on in the week as a booster</p> <p>15* : gratitude intervention listing three of five things they were grateful for daily</p> <p>16*: gratitude intervention listing three things they were grateful for daily</p> <p>17*: gratitude intervention listing 10 things they were grateful for once a week</p> <p>18: gratitude intervention listing five things they were grateful for at least three times a week</p> <p>19: gratitude intervention listing the things they were grateful for daily</p>	<p>1: 4 weeks</p> <p>2: 3 weeks</p> <p>3: 4 weeks</p> <p>4: 1 week</p> <p>5: 10 weeks</p> <p>6: 2 weeks</p> <p>7: 3 weeks</p> <p>8: 2 weeks</p> <p>9: 5 weeks</p> <p>10: 2 weeks</p> <p>11: 2 weeks</p> <p>12: 3 weeks</p> <p>13: 2 weeks</p> <p>14: 6 weeks</p> <p>15: 8 weeks</p> <p>16: 8 weeks</p> <p>17: 5 weeks</p> <p>18: 3 weeks</p> <p>19: 2 weeks</p>	<p>1: Self-reported sleep quality</p> <p>2: Self-reported physical symptoms</p> <p>3: Self-reported control of asthma symptom, Forced expiratory, volume (FEV1)</p> <p>4: Self-reported sleep quality, Total sleep time</p> <p>5: Self-reported physical symptoms, Hours spent exercising</p> <p>6: Self-reported physical symptoms, Hours spent exercising Some concerns Hours slept, Self-reported sleep quality Amount of pain relievers, coffee and alcohol consumed daily</p> <p>7: Self-reported sleep quality, Self-reported physical pain, Self-reported physical symptoms, Self-reported hours spent exercising</p> <p>8: Self-reported physical symptoms</p> <p>9: Self-reported sleep quality</p> <p>10: Workplace absence due to illness, Self-reported sleep quality</p> <p>11: Blood pressure, Cortisol, Heart rate</p> <p>12: Self-reported physical symptoms</p> <p>13: Self-reported physical symptoms, Some concerns, Self-reported sleep quality, Amount of pain relief used</p> <p>14: Inflammation markers (IL-6 and TNF-alpha)</p> <p>15: Heart Rate Variability NS Low risk Inflammatory biomarker index</p> <p>16: Glycaemic control</p> <p>17: Self-reported physical symptoms</p> <p>18: Self-reported sleep quality</p> <p>19: Disordered eating behavior</p>	<p>1: NS</p> <p>2: Improvements to physical symptoms (NR)</p> <p>3: Improvements in asthma control (NR)</p> <p>4: Improvements in sleep quality (within-group) Improvements in total sleep time (within-group)</p> <p>5: Improvements to physical symptoms (NR) Improvements to hours spent exercising (NR)</p> <p>6: NS</p> <p>7: Significant improvements in sleep quality (NR)</p> <p>8: NS</p> <p>9: Improvements in sleep quality* (d = 0.34) (at both post-intervention & 3-month follow-up)</p> <p>10: Improvement observed within group (at both postintervention & 4-week follow up) Improvements in sleep quality (NR)</p> <p>11: Improvements in ambulatory blood pressure (NR)</p> <p>12: NS</p> <p>13: NS</p> <p>14: NS</p> <p>15: Improvements in inflammatory makers (d = 1.03)</p> <p>16: Improvements in glycaemic control at 12-weeks follow-up (NR)</p> <p>17: NS</p> <p>18: Improvement in sleep quality* (d = 0.81) at postintervention (within-group) (NS at 3-week follow-up)</p> <p>19: Improvements in eating disordered behavior* (d = 0.23)</p>
Li et al.	<p>Participants were asked to post brief messages to the Social Network Group about three good things that they had experienced and for which they felt grateful then read the three good things posted by other members, and finally provide at least three feedbacks on the posted messages of others each day through comments or 'Likes'.</p>	4 weeks	<p>Probable depression.</p> <p>Anxiety</p> <p>Positive and negative affect</p> <p>Gratitude</p> <p>Happiness</p> <p>Social support.</p>	<p>The main effects of three good things-social networking (TGT-SN) and three good things only (TGT-only) in reducing depression were statistically non-significant.</p> <p>The participants of the TGT-SN group showed significantly lower anxiety symptoms and negative affect over time compared with those of the control group.</p> <p>No significant main effect was found for any secondary outcomes for the TGT-only group.</p>
Dunaev et al.	<p>Participants in the body focus Gratitude Writing exercises read the instructions: Think about aspects of your body that you are grateful for. This can be anything, including your health, physical appearance, or the functionality of your body.</p> <p>Try to come up with at least five things. Take a minute and really think about those things, picturing them in your mind.</p> <p>Once you have finished thinking about these things, choose at least three of them and write about why you are grateful for those things.</p>	1 day	<p>Weight bias internalization</p> <p>Body satisfaction and appearance evaluation</p>	<p>Participants in the gratitude condition reported significantly lower weight bias internalization and significantly more favorable appearance evaluation and greater body satisfaction when compared to the control condition. Neither gender nor BMI moderated these effects.</p>

Study	Intervention description	Duration	Main Outcomes	Summary of findings
Winslow et al.	At least twice weekly, participants were asked to think about and record two things in their job or work for which they are grateful. Mixed intervention: participants were asked to complete the gratitude intervention and a Social Connectedness Intervention each at least once per week.	4 weeks	PAWB : positive job-related affective well-being NAWB : negative job-related affective well-being Job stress	Neither intervention produced a main effect on positive job-related affective well-being, negative job-related affective well-being or job stress.
Kloos et al.	An App with gratitude exercises to improve the mental health. "Zo Erg Nog Niet", (translated "Not That Bad") is a progressive web app (PWA). Six modules covered psycho-education on several aspects of gratitude in both short movie clips and in text. Each module had one evidence-based gratitude writing exercise suitable for daily repetition. Users were advised to spend about 10–15 min a day on writing, 5 days a week (50–75 min per week).	12 weeks	Well-being Anxiety Depression Stress Gratitude as Trait Gratitude as Mood Positive Reframing Rumination Self-reported App Adherence App Evaluations	The intervention group scored better on all outcome measures compared to the control group at T1 (six weeks later). These effects were maintained at T2 (12 weeks later). The control group scored equally well on all outcome measures at T2 after following the intervention. Effects of the intervention on well-being were partially explained by gratitude, positive reframing, and rumination, and finishing a greater number of modules was weakly related to better outcomes. The intervention was generally appealing, with some room for improvement.
Geraghty et al.	The participants were asked to complete Automatic Thought Records (ATR), self-help study via the Internet, each day. Participants recorded the situation they were in when they felt dissatisfied with their body and the negative thoughts they had at the time. They then practiced providing support for and against their negative thoughts, and finally thinking in a more neutral, balanced way.	2 weeks	Body dissatisfaction Expectancy Locus of control Adherence and difficulty	The gratitude intervention reduced body dissatisfaction when compared to the control condition. Participants in the gratitude group were more than twice as likely to complete the intervention compared to those in the monitoring and restructuring group.
Neumeier et al.	7 exercises accessible Online which is a single positive intervention design approach. To allow for a comparison of the content of both programs, the gratitude program was presented in the exact same way as PERMA-based program, differing only in the instructions of six exercises and exercise-related information.	7 exercises done in 13 days on average	General subjective well-being: happiness, satisfaction with life, positive and negative affect Work-related subjective well-being: happiness at work, job satisfaction, positive and negative affect at work	Participants of the gratitude program and the PERMA-based program reported significant increases in employee well-being after the intervention, as compared to no increases in the wait list control group.
Wong et al. (1)	A gratitude Writing adjunctive intervention for psychotherapy clients. Participants in the gratitude condition wrote letters expressing gratitude to others for at least 20 minutes in each session with three writing assignments, on the day of recruitment, one week later, and the third a week after that.	3 weeks Follow up: 4 weeks as well as 12 weeks after	Behavioral Health Measure: well-being, psychological symptoms and life functioning Linguistic inquiry word count: a computer text analysis software that enables researchers to study people's psychological profiles in a non-intuitive way that obviates the problem of response bias (e.g. self-deception and social desirability) present in self-report measures.	Participants in the gratitude condition reported significantly better mental health than those in the expressive and control conditions, whereas those in the expressive and control conditions did not differ significantly. Moreover, lower proportions of negative emotion words in participants' writing mediated the positive effect of condition (gratitude versus expressive writing) on mental health.
Lindauer et al.	Patients completed gratitude Forms twice daily for up to 6 shifts and a study discharge form documenting intervention perception. In response to the patients' gratitude-related feedback, RNs (registered nurses) recorded patient experience-related actions they and interprofessional teams could implement.	3 days	Patient's perceptions of the nurse-led gratitude intervention Nurses identification of actionable items that could be taken by team members to improve the patient's hospitalization experience	On average, patients perceived the nurse-led gratitude intervention as helpful and improved hospitalization experiences. Most of the time actions were required or to be taken, based on patient gratitude intervention responses.
Cousin et al.	5*: Examined whether a brief subjective well-being intervention would have favorable effects on cardiovascular and neuroendocrine function and on sleep. 11*: Examined whether gratitude journaling improved biomarkers related to HF prognosis. 1-2-3-4-6-7-8-9-10-13 : No gratitude interventions	5: 2 weeks 11: 8 weeks	5: Cardiovascular and neuroendocrine function and on sleep 11: Inflammatory biomarker	Results of 13 studies (from an original pool of 234), both experimental (n = 11) and non-experimental (n = 2) show that gratitude positively impacts biomarkers such as endothelial dysfunction, prognostic inflammatory markers, and improves adherence to health behaviors. 5 : Gratitude group had a greater decrease in ambulatory diastolic BP 11: Gratitude intervention was associated with reduced inflammatory biomarker index score over time and increased parasympathetic HRV responses during the gratitude journaling task, compared with TAU.

Study	Intervention description	Duration	Main Outcomes	Summary of findings
Kim-Godwin et al. (1)	Journaling focused intervention on best possible self and gratitude. Participants were given a journal along with weekly writing instructions and prompts (approximately 15 to 20 minutes for each entry) and asked to make entries at least three times per week.	6 weeks	Life satisfaction Gratitude Stress Depressive symptoms Anxiety Somatic symptoms blood pressure measure and saliva cortisol	Findings indicated a statistically significant decrease in stress level, anxiety, somatic symptoms, and depression, as well as increased gratitude among participants. Repeated measures analysis of variance indicated the journaling intervention showed a statistically significant reduction in systolic blood pressure, but not diastolic blood pressure, or cortisol level at the three testing times.
Jung et al.	Weekly rehabilitation room of the mental health center to which the experimental group belonged and provided gratitude disposition promotion program for chronic schizophrenic patients in community as the experimental group twice a week (Tuesday and Friday) about 45 min for a total of eight sessions.	4 weeks	Gratitude disposition Depression Quality of life	The participants who received the gratitude disposition promotion program showed significant improvements in gratitude disposition and in quality of life, but no significant difference in depression
Bai et al.	The BMG (brief mindfulness group) completed four sessions and listened to a 20-minute audio daily, including guided mindfulness breathing and body scan. The GJG (gratitude journal group) completed four sessions and wrote three gratitude journals daily.	4 weeks	Depression Anxiety Sleep quality Infertility-related stress Mindfulness disposition Gratitude hCG performed 2 weeks after embryo transfer	There were no significant effects on any of the variables for the gratitude journaling group, compared with the control group.
Renshaw et al. (1)	A brief grateful thinking-only exercise. Participants were verbally instructed to “spend five minutes each day, thinking about something you are grateful for,”	2 weeks	Gratitude Satisfaction with life Subjective happiness Positive and negative affect Depression, anxiety, and stress	Compared to the control exercise, the grateful thinking-only exercise had greater therapeutic effects on happiness, life satisfaction, depression, stress, and negative affect.
Komase et al. (1)	A gratitude intervention program that included Gratitude Lists and behavioral gratitude expression using exercise using e-mail to list participants’ feelings of gratitude and the reasons for such gratitude 3 times a week.	3 weeks	Work engagement Secondary outcomes: gratitude, self-efficacy, psychological distress, and job performance	Work engagement showed no significant improvement after the intervention. However, gratitude, self-efficacy, psychological distress, and job performance improved significantly.
Ganz et al.	A 6-day immersive Psychosocial Training Program, followed by 10-min daily psychosocial exercises for 30 days.	36 days	Depression severity Secondary outcomes: overall well-being, accomplishment, meaning, relationships, engagement, positive emotion, sexual satisfaction, satisfaction with life, hope, and gratitude.	Depression severity improved over time, with a significantly greater reduction in the psychosocial training program group (–82.7%) vs. the gratitude group (–23%), $p = 0.02$ for baseline vs. week six. Seventy-nine percent (11/14) of depressed participants in the intervention condition were in remission (PHQ-9 ≤ 4) by week one and 100% (14/14) were in remission at week six. Secondary measures of anxiety, stress, loneliness, and well-being also improved by 15–80% in the intervention group (vs. 0–34% in the control group), $ps < 0.05$.
Komase et al. (2)	Nine interventions reported in eight studies adopted gratitude list while one study conducted psychoeducational group sessions. 1: Gratitude list (web-based) 2: Gratitude list (web-based) 3*: Gratitude list (paper-based) 4: Gratitude list (web-based) 5: Gratitude list (web-based) 6*: Gratitude list (paper-based) 7A*: Gratitude list (web-based) 7B*: Gratitude list (web-based) 8: Others	1: 4 weeks 2: 4 weeks 3: 4 weeks 4: 8 weeks 5: 2 weeks 6*: 4 weeks 7A*: 7 days 7B*: 7 days 8: 2.5 h x 5 times	Workers’ mental health and well-being Mental health included anxiety, perceived stress, depression, and mental disabilities	Nine out of 1957 articles met the inclusion criteria. Eight studies adopted gratitude list interventions, showing a significant improvement in perceived stress and depression; however, the effects on well-being were inconsistent. Interventions with gratitude list four times or less did not report significant changes in any outcomes.

Study	Intervention description	Duration	Main Outcomes	Summary of findings
Hatori et al.	Mentally subtracting a present good (MS) group: Writing with surprise the ways that a positive thing or event might never have happened or might never have been part of life. Counting gratitude group (CG): Writing without surprise the ways in which a positive thing or event happened easily or was certain to become a part of life.	Signe session (one day)	Positive and negative emotions	The mentally subtracting (MS) group experienced significantly increased positive emotion and decreased negative emotion between pre-test and post-test. The MS group showed significantly greater positive emotion than the control group at post-test.
Heckendorf et al.	Gratitude intervention combines an Online gratitude training (weekly sessions) with a mobile gratitude app (daily exercises). The gratitude app should be used in a daily manner alongside the online sessions. Throughout training, participants were in contact with an eCoach, from whom they received reminders to complete the next session, feedback on demand regarding difficulties or ambiguities in conducting individual exercises as well as support on demand with technical difficulties	5 weeks	Repetitive negative thinking (RNT) Secondary outcomes included other mental health outcomes, generalized anxiety severity, worry, and resilience factors.	Participants of the gratitude intervention group reported significantly less repetitive negative thinking at T2 and 3-month follow-up as compared to wait list control group. Improvements were sustained until 6 months follow up. Results of mediation analyses revealed that the gratitude intervention exerts its effect on anxiety and depression by reducing the risk factor of RNT, while the mediating role of resilience was less clear.
Czyzowska et al.	Specially prepared Paper Diaries: participants were asked to write down every day for 7 days three things for which they feel grateful, to whom they are grateful and if and how they expressed their gratitude.	1 week	Meaning in life General health Psychological Well Being Expressing gratitude	In the experimental gratitude group significant increases were observed in three areas of psychological well-being: environmental mastery, relationships with others and purpose in life. The significant decrease was also noted in anxiety/insomnia and depression symptoms as well as in perceived stress. There were no differences in the level of meaning in life. There was a positive relationship between expressing gratitude and meaning in life and psychological well-being.
O'Connell et al. (1)	Two groups: a traditional Gratitude Journal (fostering gratitude for daily life) and an interpersonal gratitude journal (fostering gratitude for one's existing social relationships)	2 weeks	Gratitude Friendship Life Satisfaction Positive affect	The traditional gratitude intervention (vs. interpersonal gratitude journaling) showed improvements in friendship at immediate post-test and 1-month follow-up, and these effects were accounted for by changes in gratitude over time. Additionally, the traditional gratitude intervention (vs. control) predicted enhanced life satisfaction at follow-up, and this was serially mediated by 6-week changes in gratitude and perceived friendship quality.
Moieni et al.	Gratitude Writing Intervention. The intervention was structured as a weekly, variable writing task based on several recommendations. Participants wrote once a week (Sunday evening) and reviewed their writing later on in the week (on Wednesday evening, as a booster).	6 weeks	Inflammatory outcomes	Those in the gratitude intervention (vs. control) reported higher postintervention levels of support-giving. Although there was no effect of the gratitude intervention on postintervention inflammatory markers, increases in support-giving across the entire sample were related to decreases in inflammatory markers.
Renshaw et al. (2)	An adaptation of the gratitude letter-writing-and-visit intervention, using notes instead of letters and using Instant Communication Technology (text message, e-mail, Twitter or Facebook message) instead of personal visits	2 weeks	Subjective wellbeing and psychological distress indicators Gratitude, Optimism, Life Satisfaction, Depression, Anxiety, Stress, School Connectedness, Loneliness.	Results indicated that, compared to the active control conditions, the gratitude-based intervention had greater positive effects on optimism and school connectedness, but that it also had small iatrogenic effects on depression and gratitude.
O'Connell et al. (2)	3 Types of gratitude interventions were used: (a) a reflective interpersonal gratitude journal designed to foster gratitude for other people; (b) a reflective-behavioral interpersonal gratitude journal designed to foster gratitude for other people and subsequently expression of that gratitude (express gratitude to a person face to face or through a note, Email etc.); and (c) an active control journal	3 weeks	Life Satisfaction Positive and negative experiences and affect Gratitude Depression Gratitude Expression Relationship Satisfaction	Participants in the reflective-behavioral condition experienced the greatest improvements in affect balance and reductions in depression at immediate posttest. Both gratitude interventions improved affect balance at 1 month, compared to the control. Changes in affect balance for those in the reflective-behavioral condition were mediated by the rate at which people expressed gratitude in their existing relationships. This effect was moderated by participant's baseline depressive status.
Schnitker et al.	Framing Gratitude Journaling as prayer. Write 10 things for which participants were grateful for once a week. Participants were randomly assigned to read their thanks aloud to themselves, read their thanks to another person, or pray their thanks aloud to God.	5 weeks	Satisfaction with life Positive and negative affect Gratitude Hope Health Symptoms	Participants in the prayer condition experienced a decrease in negative affect, and participants in the prayer condition who also exerted high effort demonstrated gains in gratitude, positive affect, and hope. Results indicate that the prayer condition may have led to increased health symptoms. Non-significant effects for the social condition suggest that the mechanisms explaining the effects of prayer are related to the theistic and sacred elements of prayer rather than its social features.

Study	Intervention description	Duration	Main Outcomes	Summary of findings
Wong et al. (2)	Gratitude Group Program, that includes gratitude activities : each of the five weekly sessions addresses a different facet of gratitude—micro gratitude, gratitude savoring, interpersonal gratitude, redemptive gratitude, and macro gratitude.	5 weeks	Psychological distress State gratitude Satisfaction with life Meaning in life	Participants in the group program showed a decrease in psychological distress and increase in state gratitude, satisfaction with life, and meaning in life.
Timmons et al.	(a) General gratitude group: participants were asked to recall a time they were grateful for something someone did for them and to write a letter to that person. (b) Child-specific gratitude group: write a letter to their child with autism spectrum disorder about something the child did that the parent was grateful for. (c) Control group: write a list of their activities from the previous week	8 weeks	Maternal well-being Parenting sense of competence Child behavior Maternal characteristics Relationship quality	Across all conditions, including the life events control group, mothers improved in well-being, parenting self-efficacy, positive maternal characteristics, and relationship quality. Group differences were found only for parenting satisfaction (significantly increased in the control group and child-specific gratitude condition, but not on the general gratitude condition) . Changes in reported child behavior problems were non-significant.
Bartlett et al.	Daily gratitude Writing exercise: consisted of listing three good things that happened that day and why they happened. Participants in the control group simply completed the daily survey measures.	3 weeks	Gratitude Loneliness Subjective well-being Subjective health Health symptoms Activities of daily living	Within-person variability in gratitude predicted differences in loneliness and health. Those in the treatment group showed stronger cumulative effects of gratitude on loneliness and health symptoms when aggregated across the 20-day study. Loneliness acted as a mechanism for gratitude’s differential impact on subjective well-being and health symptoms across conditions.
Bohlmeijer et al. (1)	Psycho education and evidence-based gratitude exercises which were send by Email each week. Throughout the weeks, participants practiced with counting your blessings, taking another perspective, expressing gratitude, grateful memories, writing about gratitude in times of misfortune and gratitude as an attitude in life.	6 weeks	Mental well-being Grateful mood	Findings that suggest a dose-response relationship for gratitude interventions, with gradual increase of gratitude as mood during the intervention. The effects of the 6-week gratitude intervention on mental well-being were mediated by increases of gratitude as mood at 4 weeks but not at 2 weeks.
Adair et al. (1)	Gratitude Letter—Writing intervention: spend approximately 7 min writing an appreciative letter to someone who has positively affected participant's lives (a) Self focus condition: tell someone you're grateful for what they did and why it was important to you (b) Other focus condition: tell someone you're grateful for what they did and what it says about them and about your relationship to that person	1 week	Well-being measured by: emotional exhaustion, subjective happiness and work-life balance Tool engagement	Participants in both conditions showed significant improvements in emotional exhaustion (EE), happiness, and work-life balance. The self-focused (vs other) instruction conditions did not differentially predict improvement in any of the measures. Tool engagement was high, and participants reporting higher motivation to improve their EE were more likely to improve EE a week later.
Aparicio et al.	A variety of expressions of gratitude are mentioned: handshake, a gentle pat, giving thanks through positive feedback, documents or letters, personally spoken words, gift such as flowers or candy. In summary expressions of gratitude could be explicit typically in the form of spoken or written expression was unsolicited and perceived as given with love and appreciation.	NR	Characteristics of expressions of gratitude Focus of expressions of gratitude Effect of gratitude on health professionals	Expressions of gratitude could be explicit, typically in the form of spoken or written words, or implicit; however, a key attribute was that the expression was unsolicited and perceived as given with love and appreciation. Patients and family members were grateful for what might be perceived as ‘everyday’ care and, also, for care that might be viewed as going above and beyond what was expected. The literature supports the positive and potentially far reaching impact of gratitude on health providers.
Fritz et al.	S1 : Three 8 minutes writing conditions : (a) : gratitude-to-others: participants were asked to identify an individual who had helped them in the past in a significant way and for whom they would like to accomplish their health goal and spend 8 min writing a letter of gratitude to this person (b) : gratitude-to-self: participants were asked to identify some things they appreciate about themselves and write a letter of gratitude to themselves (c) or control: participants were asked to create a list of activities they had done over the past 7 days Finally, participants were in- structed to spend at least 30min over the next week intentionally working toward the healthy eating goal they had selected. S2 : Students were randomly assigned to spend 5 min writing a letter of gratitude each week either to someone who helped them, or to list their daily activities (control group).	Study 1: 2 weeks Study 2 : 4 weeks	S1: State gratitude, eating behavior, Positive and negative affect, intended effort S2: Student assent and demographic information, Eating behavior, Positive and negative affect, Indebtedness, Connectedness, Elevation, Humility, State gratitude	Study 1: among undergraduate students attempting to achieve a healthy eating goal, state gratitude following a writing activity significantly predicted healthier eating behavior 1 week later. Study 2: Teens who expressed gratitude reported healthier eating behavior over time, relative to controls, and this effect was partially mediated by reductions in average negative affect across the intervention period. Findings suggest that gratitude-based interventions may facilitate improvements in healthy eating behavior in adolescents and young adults.

Study	Intervention description	Duration	Main Outcomes	Summary of findings
He et al.	In a Writing task, participants were asked to write to express gratitude to their health status or one of the significant others in their life.	Signe session (one day)	Mood Measures: happiness, satisfaction, pride, gratitude, appreciation, sad, anger, indebtedness, shame, guilt Perceived Social Distance	Results indicated that participants in the condition of writing about gratitude to significant others felt indebted regardless of perceived social distance, while those in the condition of writing about gratitude to his/her own health and those in the control condition experienced lesser indebtedness as the perceived social distance with others becomes closer. Gratitude increases as perceived social connectedness increases across all conditions.
Valdez et al.	Facebook-based gratitude intervention. Participants were asked to join specific private Facebook groups created by the experimenter. Then, students were asked to post five things they were grateful for. For the second week, students were asked to post a short essay that describes the person they are thankful for. Participants were also tasked to post a letter in their private Facebook group to the person they would like to express their gratitude as their third week activity.	3 weeks	Academic achievement Gratitude Academic motivation Academic engagement	In the quantitative phase: students who were assigned to the intervention condition had higher scores than those in the control condition, on autonomous motivation, controlled motivation, and cognitive engagement. In the follow-up qualitative phase: Facebook-based gratitude intervention increased such learning outcomes because this intervention could promote social support, motivation, positive thinking, and desire to pay back parents and other significant people. This research suggests that designing online gratitude intervention via social media platform can boost positive learning processes and outcomes.
Cregg et al.	Intervention characteristics. The majority of studies (k = 19) used an intrapersonal gratitude intervention, four used an interpersonal intervention, two combined both types of interventions into a single condition, and two studies included both types of activities in separate groups and were thus not included in the moderator analysis. Twenty studies were conducted online and seven were conducted offline. Gratitude journal: 4 Gratitude list: 14 Gratitude visit : 1 Gratitude visit and list: 1 Gratitude diary and letter: 1 Gratitude list and meditation: 1 Gratitude journal for unpleasant memory: 1	From 1 to 8 weeks	Depression Anxiety	Gratitude interventions had a small effect on symptoms of depression and anxiety at both post-test and follow-up. Moderation analyses indicated effect sizes were larger for studies using waitlist, rather than active, control conditions at post-test and follow-up.
Lau et al.	Gratitude Journal for unpleasant memory. Participants in groups of 10–15 were invited to a laboratory in which they wrote up to five events in a 15–20 min period. Modeled after Emmons and McCullough (2003), participants in the gratitude condition were asked to recall gratitude-inducing events for which they feel “grateful, thankful, or appreciative,” in which they recognize and respond with grateful emotion to the outcomes that one obtain and have a feeling of thankful appreciation for favors received.	1 day	Death anxiety Positive and negative affect	Participants in the gratitude induction reported lower death anxiety than the hassle and the neutral condition, whereas no difference was observed for the latter two conditions. There was no experimental effect on positive affect, and a significant effect on negative affect but which did not favor the gratitude condition.
Carter et al.	Positive Thinking Diary: this diary intervention requires participants to write down three positive events that happen each day and to reflect on why these have occurred. Inside the booklet each day of the week was allocated a separate page, on which were three boxes labelled Good Thing 1, 2 and 3. Each box had space for the good thing to be written in it, as well as the causal explanation.	1 week	Happiness Depression	The intervention led to an increase in happiness and a decrease in depressive symptoms immediately following the intervention and at a three-month follow-up. Children who had unhappier baseline scores benefitted more from the intervention.
Du Plessis et al.	The participants completed two gratitude Lists at two distinct time points. At the first opportunity, participants had to indicate five things they were grateful for during that particular week while at the second opportunity (approximately three weeks later) participants had to indicate five things they were grateful for in their lives.	3 weeks	"Gratitude items"	A sample of 933 undergraduate students submitted gratitude lists, resulting in over 9000 unique 'gratitude items. Thematic analysis revealed several prominent themes, such as gratitude for relationships (37,4%), material resources (11,55%), being at university (16,95%), life and health (11,76%), and, finally, religious gratitude (6,1%).

Study	Intervention description	Duration	Main Outcomes	Summary of findings
Chun et al.	A single in-depth Interview, ranging from 1 to 4 h, was conducted and recorded at each participant's home to explore the characteristics of gratitude following traumatic spinal cord injury (SCI).	Single session (one day)	Experiences of gratitude	Fifteen participants including two negative cases with SCI shared individual experiences of gratitude according to five themes: (a) everyday life, (b) family support, (c) new opportunities, (d) positive sense of self, and (e) gratitude to God. The findings demonstrated that participants benefited from their efforts to appraise challenging life experiences as positive.
Chang et al.	Gratitude Expression Treatment: A brief, low-cost behavioral technique to increase everyday expressed gratitude to a romantic partner. The couple-member who had expressed gratitude in the lab conversation was randomly assigned to receive additional instructions (gratitude expression treatment; GET condition) or not (control condition). In GET, the expresser created an if-then plan to express gratitude to the partner more frequently in the subsequent weeks.	5 weeks	Time spent in physical presence with partner Relationship satisfaction Expressed gratitude, showing love, and "relationship maintenance behaviors" Genotyping	Random assignment to the gratitude expression treatment (GET) increased the amount of time couples spent co-present in everyday life, relative to the control condition. This effect was mediated by the change in expressed gratitude. Further analyses with a functional genotype related to the oxytocin system (rs6449182) suggest a neurochemical pathway involved in the effects of expressing gratitude.
Cheng et al.	Participants in the gratitude and hassle group wrote work-related gratitude and hassle Diaries respectively twice a week for 4 consecutive weeks. A no-diary group served as control.	4 weeks	Depressive symptoms Perceived stress	Significant Treatment × Time interaction effects were found for the gratitude intervention, whether it was compared with control or hassle; the general pattern was a decline in stress and depressive symptoms over time, but the rate of decline became less pronounced as time progressed. Hassle and control were basically indistinct from each other. Relative to control, the gratitude group reported lower depressive symptoms and perceived stress at follow-up. Results for the comparison between gratitude and hassle were similar.
Kim-Godwin et al. (2)	Gratitude (GW) Journal or a best possible self (BPS) journal. For their writing, they were asked to think about all the things they were grateful for (GW group), or to imagine the best possible life (BPS group). Each week involved different domains, such as family life, health, or relationships in both journals.	6 weeks	Religiosity Religious coping Satisfaction with life Optimism Gratitude Commonly used coping strategies in pre-test Experiences of diary writing intervention in post-test	Findings indicated statistically significant increases in optimism and gratitude levels after completing the writing intervention. The BPS group showed improvement in life satisfaction and optimism, while the GW group did not show statistical changes in any emotional well-being variable. The mothers commonly used coping methods for parental distress were emotion-and meaning-focused coping. The three themes of journal writing experience were positive thinking, emotional well-being, and mental health self-care.
Ghandeharioun et al.	"Kind and Grateful," an android smartphone App utilizing inspirational content to promote gratitude, through which they were asked to express gratitude. The app displayed inspirational content only to the intervention group. Novel to this work, mobile sensor data is utilized to infer optimal moments for stimulating contextually relevant thankfulness and appreciation.	Round 1: 2 weeks Round 2: 5 weeks	Gratitude and appreciation Current mood	In both rounds of the RCT, the intervention was associated with improved thankful behavior. In the course of the study's 5 weeks, increases in dispositional gratitude and in psychological wellbeing were also apparent. Data suggests that the more successful times for eliciting expressions of gratitude tend to be shortly after a social experience, location change or physical activity.
Toepfer et al.	Experimental group: Letter of gratitude Control group: no writing component	3 weeks	Happiness (positive affect) Life-satisfaction (cognitive evaluation) Depression (negative affect) Gratitude	Writing letters of gratitude increased participants' happiness and life satisfaction, while decreasing depressive symptoms.
Smyth et al.	A gratitude intervention on 5 evenings whereby they Listed their gratitude and persons they felt gratitude towards.	5 days	Gratitude Happiness Positive and negative affect	Feelings of gratitude significantly improved immediately after and one week after the intervention in married women, but not single women. There was no change in trait and average state well-being and ill-being for either married or single women. Results suggest that a brief gratitude intervention is effective in enhancing married women's gratitude feelings but not single women.

Study	Intervention description	Duration	Main Outcomes	Summary of findings
Srivastava et al.	3 good things exercise and gratitude Letters. All the instructions were given via face-to-face interaction to the participants in virtual mode.	3 weeks	Depression Anxiety Stress Well-being Subjective happiness Gratitude	It was found that after administering a single gratitude intervention there was a significant increase in mental health, happiness, and gratitude and a decrease in depression, anxiety, and stress in the experimental group. Moreover, after administering two gratitude interventions together, a greater increase was seen in these variables as compared to the administration of a single gratitude intervention. There was no significant change in the control group in both cases.
Salzmann et al.	For the psychological intervention prior to the stress (MAST), participants were randomized to one of three conditions: (a) Writing about and imagining possibilities and strategies involved in how they dealt successfully with stressors in the past (EXPECTATION condition), (b) Writing a letter of gratitude to a significant other and thinking about the impact this had on their own lives (GRATITUDE condition), or (c) writing about neutral content (DISTRACTION condition).	Single session (1 day)	Expectations Emotions Perceived stress Salivary cortisol Alpha-amylase	EXPECTATION specifically increased personal control expectations and GRATITUDE specifically increased gratitude. EXPECTATION and DISTRACTION led to lower cortisol concentrations after stress induction than GRATITUDE. We detected no intervention effects on alpha-amylase or perceived stress. Optimism moderated intervention effects on cortisol.
Otsuka et al.	Participants in the gratitude group were asked to write down up to five people at work or in one's personal life to whom the participant was grateful or thankful during the past week in a journal.	4 weeks	Well-being, such as positive affect, life satisfaction and subjective happiness	According to the results, the main effect of time was significant for positive affect ($F=8.90$, $p < 0.01$) and subjective happiness ($F=4.45$; $p < 0.05$), suggesting that positive affect and subjective happiness were increased irrespective of groups
Carson et al.	The intervention comprised two 2-hour Workshops about gratitude. Participants not only introduced themselves but also gave their psychiatric diagnoses. Provider asked participants, to complete the Life Thankfulness. Each participant was asked to state what gratitude meant for them. Provider then explained about the monthly monitoring and handed out the monthly diaries. All participants were given five 'Thank You' cards and stamps. Each day they were expected to write down three things they were thankful for and why? They also had to record who they sent their five 'Thank You' cards to.	4 weeks	Gratitude Measure Well-Being Life Satisfaction General Happiness Life Thankfulness Review.	Pre and post questionnaire assessment showed a number of positive benefits resulting from the intervention. Participants reported being thankful for more things in their lives, had improved Life Satisfaction, greater environmental mastery, and higher social feelings. All four changes were statistically significant.
Cunha et al.	Participants assigned to the intervention condition were asked to write Daily Gratitude Lists for 14 days, listing moments they had been grateful for during the day.	2 weeks	Positive and negative affect Depression Subjective Happiness Life Satisfaction	The gratitude intervention managed to increase positive affect, subjective happiness and life satisfaction, and reduce negative affect and depression symptoms. This change was greater than the changes in the control groups in relation to positive affect. In the other outcomes analyzed, similar changes were observed in the gratitude intervention and the neutral events intervention.
Bohlmeijer et al. (2)	The 6 weeks gratitude intervention consisted of evidence-based gratitude exercises which were mainly writing exercises and questions that trigger reflection about cultivating gratitude. On average, we expected that participants would invest around 15 min a day on 5 days per week (75 min per week). Participants in the active control condition were instructed to perform five self-kindness activities on one day per week.	6 weeks	Well-being Depression Anxiety Dispositional gratitude Grateful mood Adherence Client satisfaction	The gratitude intervention was more effective in improving mental well-being in comparison to the self-kindness intervention and waitlist control. The data also demonstrated that the gratitude intervention was superior to waitlist control and practicing self-kindness on various measures of gratitude but not on distress.
Arps et al.	Participants in both conditions received a daily text-message for 28 days. In the gratitude condition, participants were sent text-message questions which attempted to prompt reflection on a specific gratitude domain. In the reflective control condition, participants were asked to respond to questions which attempted to prompt reflection about their life, hobbies, interests, and opportunities.	4 weeks	Gratitude Life Satisfaction Well-Being Self-Esteem Depression Anxiety	Young people showed positive changes over the course of the program in their general sense of gratitude, subjective well-being, and reduced depressive symptoms, with some evidence that those with higher levels of depressive symptoms benefited more from the gratitude program. However, there were no significant differences across the two groups in the magnitude of these mental health changes. Participants in both conditions valued and were highly engaged with the interactive text-messaging approach.

Study	Intervention description	Duration	Main Outcomes	Summary of findings
Armenta et al.	Students were assigned to spend 10 minutes each week (a) writing gratitude Letters to their parents, teachers, coaches, or friends and completing additional gratitude-related reflection activities (gratitude group) or (b) try to become more organized each week by listing their daily activities and reflecting on the obstacles and benefits (control group).	4 weeks	Life satisfaction Improvement motivation Grade point average (GPA) Mediators: connectedness, elevation, humility, indebtedness, general negative affect.	Relative to controls, students in the gratitude conditions reported greater life satisfaction and motivation to improve themselves and maintained these levels throughout the semester. This sustained self-improvement motivation and life satisfaction were partially mediated by increases in feelings of connectedness, elevation, and indebtedness. Interestingly, negative affect partially mediated the effect of gratitude on life satisfaction, but not on improvement motivation. No group differences emerged in academic performance over time.
Ika et al.	Session 1: Gratitude reappraisal (identify the negative responses in past experiences and training to change negative perspectives). Session 2: Gratitude recounting (sharing things that subjects were fully grateful of). Session 3: Gratitude reflection (open subjects' eyes to all the good things that had happened to them). Session 4: Expression of Gratitude	4 sessions. No duration	Mental health	Gratitude intervention proved to be effective to improve teacher's mental health.
Venturo-Conerly et al.	Discussions around the importance of gratitude, saying the things and people toward which participants felt grateful, gratitude letter, three-good things.	Single-session (one day)	Anxiety Depression Happiness	The single-session gratitude intervention did not reduce symptoms of depression and anxiety in a significant manner. Single-session values and growth interventions both reduced anxiety symptoms.
Peters et al.	1-hour individual introductory session at the research lab followed by one week of daily imagery exercises performed at home. Participants were instructed to focus on the positive aspects of their life and think about all the things they were grateful for. They were asked to think about this in relation to three different domains (personal, relational and professional) and to write about each domain for 5 minutes. Next they identified the two most important things they were grateful for in each domain and formulated these into statements starting with "I am grateful for..". They chose one statement for their 5-minute imagery exercise in the lab and were instructed to imagine a different statement each day during the next week.	1 week	Life satisfaction Optimism	Whereas in the gratitude condition, the time trend showed a significant increase in satisfaction with life from baseline to the week-1 and week-2 assessment, neither time point was significantly different from the control condition, and there was also no difference from the BPS condition. The gratitude condition did not show any effect on either dispositional optimism or optimistic attributions.
Khanna et al.	(a) Stress Management Training (SMT): participants were led through a new stress management technique every fortnight (b) Gratitude Journaling (GJ): every week, participants were asked to write five things for which they felt grateful during the past week. (c) Combined SMT and GJ (Combined Intervention): This group practiced a combination of both activities described previously. (d) Control Group (CG): students in this group continued with their usual class routine and were involved only during data collection	8 weeks	Emotional, social and psychological well-being Life satisfaction Perceived stress Meaningfulness Engagement in the classroom	Significant effects were obtained only on two outcome variables – social well-being and overall well-being. In both these cases, the gratitude journaling group showed lower well-being than the control group. These findings seem to suggest that none of the intervention techniques were successful in bringing about statistically significant change in participants' perceived stress, meaningfulness, engagement, or life satisfaction.
Oltean et al.	Participants allocated in the gratitude intervention group (a) were asked to submit daily Journal entries consisting of three things they were grateful for. Participants allocated in the control condition (b) were asked to submit daily journal entries consisting of three things that happened over the day.	2 weeks	Childhood Adversity Reward Processing Trait gratitude Depressive Symptoms Positive and Negative Affect Adherence and Drop-out	Findings indicated a significant decrease in depressive symptoms and negative affect in both conditions. While positive affect remained stable, a significant time effect emerged for reward processing. Childhood adversity severity, but not multiplicity, moderated the effectiveness of the intervention, adherence and drop-out. Trait gratitude moderated the effectiveness of the gratitude intervention only on depressive symptoms.

Study	Intervention description	Duration	Main Outcomes	Summary of findings
Berger et al.	(a) Interpersonal list: Participants noted daily three things attributable to a person/people, for which they felt grateful. (b) Non interpersonal gratitude list: Participants noted daily three things not attributable to other people, for which they felt thankful. (c) Interpersonal letter: Participants wrote three letters (1 per week) to a person toward whom they felt grateful. (d) Interpersonal list and interpersonal letter: Participants noted daily three things each day, attributable to a person/people, for which they felt grateful, and wrote three letters (1 per week), to a person toward whom they felt grateful.	3 weeks	Interpersonal trait gratitude Non interpersonal trait gratitude General trait gratitude Positive and negative affect Depression Life satisfaction	All interpersonal gratitude interventions led to an increase in interpersonal but not non-interpersonal trait gratitude, and the non-interpersonal gratitude list led to an increase in both non-interpersonal and interpersonal gratitude. For satisfaction with life (SWLS), depressive feelings (PHQ-9), and positive and negative emotions (PANAS), no significant overall differences were observed between groups. However, for satisfaction with life, depressive feelings, and negative emotions, significant overall differences were observed for time, showing that whereas the specific interventions did not vary in their efficacy, all led to changes in the variables assessed.
Shin et al.	(a) Control condition: write objective facts about participant's parents (b) Gratitude condition: write a gratitude Letter participant's parents	Single session (1 day)	Positive and negative affect Generic gratitude Familial collectivism Parent-child relationship Gratitude toward parents	Gratitude writing had a significant buffering effect on participants' positive affect 2 weeks after the intervention, but not on other outcomes. Several significant interaction effects indicated that gratitude writing was more effective for individuals who had low quality parent-child relationship and those who endorsed high levels of familial collectivism and had low quality parent-child relationships.
Gabana et al.	The Athlete Gratitude Group (TAGG) was divided in 6 session topics: micro gratitude (appreciating the simple or little things in life), intrapersonal gratitude (expressing gratitude toward oneself), interpersonal gratitude (expressing gratitude toward others), redemptive gratitude (reflecting on redemptive elements in stressful experiences for which one is grateful), macro gratitude (appreciating the big things in life), team gratitude & reflections (expressing gratitude toward teammates)	8 weeks	State and trait gratitude Mental health, Resilience, Team cohesion, Coach-athlete relationship	Results found significant improvements in athletes' state gratitude, mental health, resilience, team cohesion, and coach-athlete relationship pre- to postintervention. For the entire sample, lasting effects on mental health, resilience, and coach-athlete relationship were observed at 1-month and 3-month follow-ups. Moreover, positive effects on mental health were significantly maximized for athletes in the coach group. No significant group x time interaction effects were observed on state or trait gratitude, resilience, team cohesion, or quality of the coach athlete relationship; all athletes derived positive benefits from the program, regardless of group membership.
Karns et al.	Daily Journal entry (a) Gratitude group: participants were asked to think back over the past week and write about what they were grateful for (b) Active neutral group: participants were asked to write a detailed journal entry of 3 events	3 weeks	Gratitude Altruism	Relative to pre-test levels, gratitude journaling increased the neural pure altruism response in the VMPFC. We posit that as a context-dependent value-sensitive cortical region, the VMPFC supports change with gratitude practice, a change that is larger for benefits to others versus oneself.
Atad et al.	Gratitude Visit intervention: Participants were given one week to write and then hand deliver a letter of appreciation to someone who had been kind to them, but they had never properly thanked. Participants were asked to Upload the delivered letter to the course Website and answer two short reflective questions.	1 week	Hedonic dimension of well-being Eudaimonic dimension of well-being Prioritizing positivity Prioritizing meaning	This study's results replicated Seligman et al.'s finding suggesting a significant increase in satisfaction with life following a gratitude intervention. However, this trend was not significant when eudaimonic well-being was used as the dependent variable. Further analysis revealed that the intervention was most beneficial for people who prioritized both meaning and positivity in their lives, whereas those with different prioritizing patterns enjoyed only short-term gains. In addition, those who prioritize neither positivity nor meaning in their lives did not benefit from the intervention.
Krentzman et al	Treatment comprised the Three Good Things" exercise which asked participants to reflect on three good things that happened that day and why they happened. The sham condition asked participants to describe sleep hygiene behavior in the past 24 hours.	2 weeks	Positive and negative affect Participants' subjective experiences of the gratitude and sham conditions	The treatment group reported less negative mood and higher positive mood than the control group. However, the gratitude group started out with higher positive mood at baseline. Qualitative data indicated that the gratitude exercise was meaningful, enriching, and valuable to the treatment group.
Isik et al.	(a) Gratitude Journal group: participants were asked to, at the end of each day, write about experiences that they were grateful for, and made them feel good. (b) Wait-list control group: participants did not receive any writing assignments	3 weeks	Perceived Stress Students adaptation to college life Gratitude Life Satisfaction Positive and Negative Affect	Students in the gratitude journaling group showed significant gains in gratitude, adjustment to college life, satisfaction with life and positive affect.

Study	Intervention description	Duration	Main Outcomes	Summary of findings
Senf et al.	Daily exercises interventions consisted of two tasks. (a) The gratitude-based intervention involved: (1) a gratitude Visit (write and present a gratitude letter to someone they felt thankful for); (2) a daily gratitude writing task (three items that went well). (b) The strengths-based intervention involved: (1) an identification of their top five signature strengths; (2) a daily task in which participants were asked to use these top strengths in ways that they had not before. (c) Control group: no intervention assigned.	1 week	Happiness Depressive Symptoms Personality traits: neuroticism, extraversion, agreeableness, openness, and conscientiousness	The findings partially support the effectiveness of the gratitude and strengths-based interventions in increasing happiness and decreasing depressive symptoms compared to a control group. Two personality domains (extraversion and openness) showed significance as moderator variables: participants with higher levels of extraversion and higher levels of openness benefitted more from the gratitude intervention compared to those with lower levels.
Jackowska et al.	(a) Gratitude Journal group: participants were asked to write a gratitude diary in which they expressed gratitude towards previously unappreciated people and things in their lives. (b) Active control group: participants were asked to write things that happened to them and/or things that they noticed each day.	2 weeks	Subjective well-being Hedonic and eudemonic well-being Emotional distress Optimism Sleep measures salivary cortisol Blood pressure Heart rate	The treatment elicited increases in hedonic well-being, optimism and sleep quality along with decreases in diastolic blood pressure. Improvements in subjective well-being were correlated with increased sleep quality and reductions in blood pressure, but there were no relationships with cortisol.
Geier et al.	Participants were given assignments for weekly gratitude reflection Journals and to write up to five things they were grateful for over the past week.	10 weeks	Mental well-being	The treatment group showed significantly higher wellbeing after the gratitude intervention compared with the control group.
Oliveira et al.	(a) Gratitude condition: Participants were instructed to reflect for 3 min about recent experiences of gratitude during the previous week. Then, they were instructed to write three to five sentences about those experiences. (b) Control condition: participants were asked to write about daily tasks.	Single session (1 day)	State gratitude Positive and negative affect Empathic concern Prosocial intentions	Our manipulation led to increases in state gratitude, which in turn increased positive emotions and empathic concern, leading to increased prosocial intentions in both countries. A content analysis of participants' responses in the gratitude group revealed that relationships with others and health and well-being were the central themes of their gratitude experiences during the COVID-19 global pandemic.
Pearson et al.	All participants took part in an Interview conducted by the first author. Following the interview, participants were invited to keep a gratitude diary, recording up to three things for which they felt grateful each day, over the course of 7 days.	1 week	Interpersonal gratitude Gratitude as a life experience Use and acceptability of the gratitude diary	Gratitude holds interpersonal and transpersonal meanings for people living with dementia, balanced with challenges of dementia and ageing.
Adair et al. (2)	Three prospective cohort studies tested the efficacy of web-based interventions: Three Good Things (S1), Gratitude Letter (S2), and the Looking Forward Tool (S3). S2: Spending approximately 7 minutes writing a letter of gratitude	S1 : 2 weeks S2 : single session (1 day) S3 : 1 month	Burnout Depressive symptoms Subjective happiness Work-life balance Emotional thriving and emotional recovery Optimism	Across all studies, participants reported improvements in all metrics between baseline and post assessments, with two exceptions in study 1 (emotional thriving and happiness at 6 and 12-month post) and study 3 (optimism and emotional thriving at day 7).
Killen et al.	Participants were requested to record briefly in the 'three good things Diary' three events occurring that day that seemed positive to them, and why they viewed them positively.	2 weeks	Gratitude Well-being Flourishing Satisfaction with life Positive and negative experience Perceived stress Health related quality of life	The gratitude intervention was effective in increasing aspects of well-being in this relatively healthy elderly population with statistically significant increases in flourishing and decreases in perceived stress. There were no significant differences between paper and online delivery overall. This age group managed and many preferred online delivery.

Study	Intervention description	Duration	Main Outcomes	Summary of findings
Layous et al.	S1: Participants were asked to (a) write a general gratitude Letter to anyone they wish (general gratitude condition), (b) write a specific gratitude letter toward a person for a particular kind act (specific gratitude condition), (c) write about an intensely positive experience (joy condition) , (d) write about their best possible self (optimism condition) or (e) list what they did over the past 7 days (control condition). S2: (a) write general gratitude letters, (b) do nothing, or (c) write about their weekly activities before receiving instructions to perform kind acts.	S1 : 3 weeks S2 : 6 weeks	Life satisfaction Positive and negative affect Well-being Self-reported effort into performing kind acts	S1: Results showed that the positive activities served as triggers – that is, they predicted greater prosocial effort, which in turn predicted greater well-being. S2: The direct effect of the gratitude trigger on prosocial effort was not replicated, but people who wrote gratitude letters (versus writing about their week) reported relatively greater elevation, which predicted greater prosocial effort during the six weeks. In turn, replicating Study 1, greater effort predicted higher well-being immediately following the study.
Kaczmarek et al.	Participants were asked to write about three good things that had happened to them. Additionally, they were asked to reflect on causal explanations to each good thing.	3 Days	Likelihood of participating in a voluntary gratitude intervention Curiosity Depressive symptoms Life satisfaction Intentions to change lifestyle	Results suggested that 11.5% of participants started the gratitude intervention. Individuals endorsing strong intentions to change their lifestyle were more likely than their peers to start the gratitude intervention. People with greater trait curiosity endorsed greater intentions to start this intervention; people with greater depressive symptoms endorsed weaker intentions. Both curiosity and depressive symptoms indirectly influenced initiation of the gratitude intervention via intentions.

Studies marked with an asterisk indicate studies included in the scoping review

3.2 Different definitions of gratitude

Eight studies (9.8%) in our review adopted the definition proposed by Wood et al. (2010), describing gratitude as the emotional experience of recognizing and appreciating the positive aspects of everyday life. This involves acknowledging positive elements contingent on others' actions, experiencing positive affect, and recognizing the benefits derived from intentional, voluntary acts of others.

Six studies (7.5%) adhered to the definition by Emmons and McCullough (2003), which characterizes gratitude as a felt sense of wonder, thankfulness, and appreciation for life. Emmons and McCullough also differentiated between state and trait gratitude. Trait gratitude refers to an individual's general tendency to experience and express gratitude across various situations and over time. It reflects a more stable and enduring characteristic of a person. State gratitude, on the other hand, is a temporary and situational experience of gratitude in response to specific events or circumstances.

Meanwhile, two studies (2.4%) embraced the definition by Lambert et al. (2009), defining gratitude as recognizing the value of a general benefit in one's life or acknowledging the receipt of something valuable from another person.

Additional perspectives include Bono et al.'s (2004) definition, which views gratitude as the acknowledgment of a positive personal outcome freely bestowed by others. McCullough et al. (2002) describe it as a moral affect arising when an individual perceives benefiting from the costly, intentional, voluntary actions of another person. Finally, Park et al. (2004) associate gratitude with life satisfaction, considering it a character strength.

3.3 Different gratitude measurement tools

The most used tool to measure gratitude was the Gratitude Questionnaire-6 item (GQ-6) scale (McCullough, Emmons, & Tsang, 2002) (66), used in 38 studies of our scoping review (46.9%). It is a brief self-report instrument designed to measure dispositional gratitude. Comprising six items, the GQ-6 assesses various aspects of gratitude, including a person's tendency to notice and

appreciate positive aspects of their life, as well as their willingness to express gratitude to others. Respondents rate each item on a scale, providing insights into their overall level of gratitude.

The second most used gratitude measurement questionnaire was the three-item Gratitude Adjective Checklist (GAC; McCullough et al., 2002), that assesses state gratitude, used in 6 studies (7.4%). The GAC is a three-item measure comprised of the sum of affect adjectives: grateful, thankful, and appreciative. It can be framed over short or longer time, by varying the time specified in the instructions, e.g. right now, think about “yesterday”, or think about “the past few weeks”.

The third most commonly used questionnaire to measure gratitude was the GRAT or Gratitude Resentment and Appreciation Test (Watkins et al., 2003) (100), developed to measure someone’s trait gratitude (n=4, 4.9%). This 44-question scale is based on the existence of 3 distinct characteristics of a grateful individual: sense of abundance, appreciation of simple pleasure and appreciation of others (93). The revised version (short-form) is a collection of 16 items with a Likert-style response.

The three most used gratitude questionnaires can be found in Additional file 2.

3.4 Description of gratitude interventions

3.4.1 Overview of gratitude intervention

Among the 81 studies we examined, a majority focused on gratitude writing interventions, employing journals or lists with traditional instructions to contemplate and writing aspects for which individuals felt grateful. This methodology aligns with McCullough's approach, utilizing the three blessings exercise (Emmons and McCullough, 2003), with variations primarily in the extent of writing. Gratitude writing interventions constituted nearly half of the intervention types with 39 studies (48.2%). Notably, our findings underscore a substantial presence of technology-based gratitude interventions with 17 studies (21.0%), utilizing the internet, email, existing smartphone applications or specifically designed for fostering gratitude (Kloos et al. 2022). Furthermore, interventions explored gratitude not only on an individual level but also through human interactions, encompassing single-provider interviews (Chun et al. 2013) and extending gratitude writing interventions to include in-person visits where individuals express gratitude by delivering a gratitude letter (Renshaw et al. 2017). Group interventions, involving collective discussions on

gratitude, were also prevalent.

Additionally, our investigation identified several innovative interventions that seem pertinent to our scoping review, providing insights into how the research is approached concerning gratitude and the diverse methods employed to stimulate and cultivate gratitude.

3.4.2 Gratitude and the Senses

The most common gratitude interventions involve simple writing, such as in a journal, listing reasons for feeling grateful. More elaborate interventions engage the senses, including hearing and sight. For instance, gratitude exercises utilize visualization with techniques focusing on images like geometric shapes or soothing visuals such as flowers or an artificial flame to enhance concentration and facilitate introspection (Duthely et al. 2017). Additionally, in this study, hearing is employed to stimulate gratitude through group recitations of gratitude poems on themes of peace, serenity, or tranquility. Thus, gratitude is not only thought but also visualized or heard. Some studies consider the body not only as a receptor of gratitude through the senses but also as a source of gratitude. In this regard, the perception of the body and its functionalities has been studied, involving focusing on different body parts and explaining the importance of their functions for individuals (Davies et al., 2021). Other studies use breathing to heighten body awareness by sweeping it from top to bottom, increasing corporeal consciousness (Bai et al. 2019).

3.4.3 Gratitude and Interpersonal Relations

Some practices go beyond individual gratitude and explore its relationship with others, involving individuals in one's environment. This can take the form of gratitude visits to someone one has never thanked before (Atad et al. 2021). Gratitude is also explored within couples. In an experiment where couples face screens with various instructions, one message suggests that research implies couples who express appreciation for each other's actions tend to be happier. Couples are then encouraged to continue this practice in the following weeks (Chang et al. 2022).

3.4.4 Gratitude Across Different Platforms

To enhance participant adherence to interventions, various supports have been utilized. For example, a study provided children with an A5-sized booklet featuring a customizable smiley face on the cover. Each page represented a day with sections to list three good things, followed by a request for an explanation (Carter et al. 2018). Innovative supports, like postcards, have also been used, with each participant receiving four cards to send during the study (Carson et al. 2010). Beyond expressing gratitude, participants were asked to explain what gratitude meant to them, offering insights into individual interpretations of gratitude.

3.4.5 Technology Serving Gratitude

More sophisticated interventions have sought to enhance adherence using technology. Mobile applications have been widely used, offering gratitude modules to foster positive mindsets among participants. A Dutch application called "not that bad" incorporates gratitude exercises to promote a positive attitude (Kloos et al. 2022). It presents a module called "Gratitude as a way of life" and utilizes repeated gratitude exercises to cultivate a mindset. The use of the internet provides a dynamic and adaptive visual interface with stimulating visual effects, akin to a video game. Some researchers have also leveraged social networks, such as a Philippine study on Facebook, encouraging participants to share photos or quotes related to gratitude. The use of the social network aims to establish a connection between gratitude and academic success in an environment already familiar to participants (Valdez et al. 2021).

3.5 Acceptability and tolerance of gratitude interventions

Several studies provided qualitative insights into the acceptability and tolerance of gratitude interventions. A recurrent observation across interventions was a low compliance rate, with participants offering various reasons for non-compliance. Jung et al. (2017) noted that participants reported feeling "bored listening to the mindfulness audio," and two participants mentioned "it was easy to sleep during the audio." Additionally, some participants perceived gratitude interventions as resembling a "homework assignment from a teacher," and others struggled to find new things to write after several days, leading to repetition of previous entries.

In a study conducted by Pearson et al. (2021), participants facing vision and writing difficulties

encountered challenges in maintaining a gratitude diary and required assistance from family members. The act of keeping a gratitude journal daily was reported to induce feelings of pressure in some participants. Some participants suggested that the experience would be more enjoyable if the questions were "easier to understand." However, others expressed enjoyment in the process of writing down their feelings. Khanna et al. (2021), present qualitative post-test feedback reveals that many students perceived gain in terms of feeling relaxed and calm. Many participants reported being more attentive to daily acts of kindness as explained by Ghandeharioun et al. (2016). A number of participants noted perceiving things they noticed that they hadn't previously observed. Gratitude became part of the participants' daily routines, fostering a habit of seeking positive aspects even during challenging days. They cultivated the reflex to reevaluate situations, employing a second look approach to navigate difficulties.

3.6 Main outcomes reported

In our review, most studies focused on psychological outcomes (n=65, 80.2%). The most investigated psychological outcomes included gratitude, positive and negative affect, life satisfaction, anxiety, depressive symptoms, perceived stress, subjective well-being, and happiness.

Additionally, some studies (n=8, 9.9%) examined physical outcomes, such as glycated hemoglobin (Schache et al., 2019), sleep quality resting (Bai et al., 2019; Jackowska et al., 2016), heart rate variability (HRV) (Redwine et al., 2016 and 2019), heart rate (Jackowska et al., 2016), inflammatory biomarkers (Redwine et al., 2016 and 2019, Moieni et al., 2018), salivary cortisol (Jackowska et al., 2016; Salzman et al., 2018; Kim-Godwin et al., 2020), and blood pressure (Jackowska et al., 2016; Kim-Godwin et al., 2020). The study by Chang et al., 2022 studied functional genotype related to the oxytocin system (rs6449182) and the pathways involved in the expression of gratitude.

Another set of outcomes examined encompassed work-related or academic aspects (n=4, 4.9%), including work engagement (Komase et al., 2019), work related subjective well-being (Winslow et al., 2016; Neumeier et al., 2017), career satisfaction (Caragol et al., 2021) and academic achievement and motivation (Valdez et al., 2021).

In the majority of studies, outcomes were assessed immediately following the intervention

period (refer to table 2 for specific details regarding the duration of interventions). None of the interventions in the studies included in our review extended beyond 12 weeks.

3.7 Effectiveness of interventions

3.7.1. Effectiveness of interventions on psychological outcomes

In our scoping review, all the included studies included psychological outcomes, with the most frequently assessed variables being gratitude, positive and negative affect, life satisfaction, subjective well-being, and symptoms of anxiety or depression.

Gratitude interventions consistently led to heightened levels of gratitude across various studies (Bono et al. (2020), Kim-Godwin et al. (2020), Ghandeharioun et al. (2016), Smyth et al. (2012), Berger et al. (2019), Gabana et al. (2020), Oliveira et al. (2021), Bohlmeijer et al. (2022)).

Another commonly studied outcome was the evaluation of positive and negative affect, often measured using the Positive and Negative Affect Schedule (PANAS). The majority of studies incorporating gratitude interventions reported improvements in positive affect and/or reductions in negative affect (Fekete et al. (2022), Hatori et al. (2019), Schnitker et al. (2018), Shin et al. (2018), Krentzman et al. (2014)).

Subjective well-being, commonly assessed using the Satisfaction with Life Scale (SWLS), consistently demonstrated improvement across various gratitude interventions in the studies reviewed (Killen et al. (2015), Layous et al. (2016), Wong et al. (2016), Timmons et al. (2018), Bohlmeijer et al. (2020), Atad et al. (2021), Czyzowska et al. (2022), Geier et al. (2022)). However, an exception was noted in the study by Khanna et al. (2021), where the gratitude journaling group exhibited lower well-being compared to the control group.

Furthermore, gratitude interventions globally led to an enhancement in life satisfaction across all studies that evaluated this outcome (e.g., Carson et al. (2010), Peters et al. (2013), Duthely et al. (2017), O'Connell et al. (2017), Armenta et al. (2022)).

Regarding negative symptoms, such as anxiety or depressive symptoms, gratitude interventions seemed effective in alleviating these issues. For instance, Lau et al. (2011) demonstrated that participants engaged in the gratitude intervention group reported lower death anxiety than those in the control groups, and in Adair et al. (2020), the gratitude intervention led to

significant improvements in emotional exhaustion. Wong et al. (2017) reported a decrease in psychological distress following a gratitude intervention.

While a reduction in depression's symptoms was observed in the majority of studies assessing it (Toepfer et al. (2011), Senf et al. (2012), Cheng et al. (2015), Carter et al. (2018), Arps et al. (2018), Heckendorf et al. (2019), Cunha et al. (2019), Adair et al. (2020), Cregg et al. (2021), Ganz et al. (2022), Oltean et al. (2022), Stivastava et al. (2023)), it was not consistently found. Li et al. (2021) reported statistically non-significant effects of three good things interventions in reducing depression. Jung et al. (2017) found no significant difference in depression among participants receiving a gratitude disposition promotion program. Renshaw et al. (2017) found that, compared to active control conditions, the gratitude-based intervention had small iatrogenic effects on depression and gratitude (higher depressive symptoms and lower gratitude levels at the gratitude group). Venturo-Conerly et al. (2022) noted that the single-session gratitude intervention did not significantly reduce symptoms of depression and anxiety.

Another group of outcomes worth mentioning relates to the effects of gratitude interventions on body image and eating behaviors. Two studies found that gratitude interventions led to improvements in weight bias internalization (the process by which individuals adopt negative beliefs about their body): Dunaev et al. (2018) and Davies et al. (2021). Geraghty et al. (2010) found that the gratitude intervention reduced body dissatisfaction compared to the control condition. Fritz et al. (2018) found that state gratitude following a writing activity significantly predicted healthier eating behavior, and teens who expressed gratitude reported healthier eating behavior over time, relative to controls.

3.7.2 Effectiveness of interventions on physical outcomes

Regarding glycated hemoglobin, Schache et al. (2019) observed that participants who adhered to the gratitude intervention experienced a greater improvement in HbA1c compared to those who were less adherent.

Redwine et al. (2016) found that the gratitude intervention was associated with improved trait gratitude scores, a reduced inflammatory biomarker index score over time, and increased parasympathetic HRV responses during the gratitude journaling task, compared to treatment as

usual. However, there were no resting pre- to post-intervention group differences in HRV.

Additionally, in relation to inflammatory biomarkers, the study by Moieni et al. (2018) showed that, although there was no effect of the gratitude intervention on inflammatory markers, increases in support-giving (elicited by the gratitude intervention) across the entire sample were related to decreases in inflammatory markers.

The randomized controlled trial conducted by Jackowska et al. (2016) found that the gratitude intervention elicited increases in sleep quality along with decreases in diastolic blood pressure, with no significant effects on cortisol levels or heart rate.

In contrast to Jackowska et al., in the study by Bai et al. (2019), the gratitude journaling group did not show an improvement in sleep quality compared to the control group.

Kim-Godwin et al.'s (2020) pretest-posttest study indicated that the journaling intervention led to a statistically significant reduction in systolic blood pressure but not diastolic blood pressure (unlike Jackowska et al.), or cortisol levels at the three testing times.

In Salzman et al.'s (2018) study, the gratitude group did not show a reduction in cortisol levels compared to the control groups. There were no intervention effects on alpha-amylase or perceived stress.

In Chang et al.'s (2022) study, the functional genotype related to the oxytocin system (rs6449182) suggests a neurochemical pathway involved in the effects of expressing gratitude, with rs6449182 being significantly associated with the likelihood of expressing gratitude and showing love.

3.7.3 Effectiveness of interventions on work related or academic aspects

In this scoping review, four studies (4.9%) focused on work-related aspects or academic aspects. According to Komase et al. (2019), work engagement did not show a significant improvement after a gratitude intervention. However, there were significant improvements in gratitude, self-efficacy, psychological distress, and job performance.

In the study by Caragol et al. (2021), a statistically significant improvement in career satisfaction, coping self-efficacy, clinician autonomy, and self-care was observed following the intervention, which involved weekly gratitude journaling.

Regarding work-related subjective well-being, the Winslow et al. study (2016) did not find any influence of the gratitude intervention on positive job-related affective well-being, negative job-related affective well-being, or job stress. In contrast, the Neumeier et al. study (2017) reported significant increases in employee well-being among participants in the gratitude program compared to the wait-list control group after the intervention.

Concerning academic achievement and motivation, the study conducted by Valdez et al. (2021) with high school students revealed that individuals assigned to the gratitude intervention condition achieved higher scores in autonomous motivation, controlled motivation, and cognitive engagement compared to those in the control condition.

4. Discussion

4.1 Different types of gratitude and questionnaires used

State gratitude pertains to the transient and context-specific experience of gratitude in response to events or situations and was more frequently measured by the Gratitude Adjective Checklist (GAC; McCullough et al., 2002); as opposed to dispositional gratitude, that reflects a person's overall disposition or general tendency to be grateful, considered as a relatively stable personality trait. Dispositional gratitude was more frequently measured by the Gratitude Questionnaire-6 item (GQ-6) scale (McCullough, Emmons, & Tsang, 2002). Like dispositional gratitude, trait gratitude captures an individual's overall inclination to experience gratitude as part of their personality and is frequently measured by the GRAT or Gratitude Resentment and Appreciation Test (Watkins et al., 2003).

We found that GQ-6 was the most used questionnaire to assess gratitude in this review (46.9% of studies). In comparison to the GRAT questionnaire, GQ-6 has the advantage of being a shorter questionnaire with only six items, making it a quicker and more convenient tool for assessing gratitude. On the other hand, the GRAT is a more comprehensive instrument that measures not only gratitude but also resentment and appreciation. Depending on the research or clinical focus, practitioners may prefer the GQ-6 for its exclusive emphasis on gratitude.

4.2 Discussion of results

We discovered that the majority of studies in our review concentrated on psychological outcomes, with the most common variables being gratitude, positive and negative affect, life satisfaction, subjective well-being, and symptoms of anxiety or depression. With few exceptions, gratitude interventions consistently enhanced gratitude, positive affect, and life satisfaction, while simultaneously reducing negative affect and symptoms of anxiety. Inconsistencies emerged in studies evaluating depressive symptoms: although most found that gratitude interventions alleviated depression symptoms, some did not yield statistically significant results (Li et al., 2021; Jung et al., 2017; Conerly et al., 2022), and one even identified small iatrogenic effects of gratitude interventions on depression (Renshaw et al., 2017). Gratitude interventions also resulted in increased life satisfaction and demonstrated positive

impacts on body image and eating habits. Overall, our review indicates that gratitude interventions exert beneficial effects on psychological outcomes. Conducting a systematic review on the impact of gratitude interventions on depressive symptoms would be advantageous for gaining insights into the relationship between these interventions and the symptoms of depression.

When considering physical outcomes, we observed a scarcity of studies focusing on such aspects, with only eight studies in our review (9.9%), and the findings were inconsistent. This variability can be attributed to the diverse outcomes measured and the limited number of studies available. Some studies reported positive results: Schache et al. (2019) noted that gratitude led to an improvement in HbA1c; Redwine et al. (2016) found a reduced inflammatory biomarker index score and increased parasympathetic HRV responses during the gratitude journaling task; Jackowska et al. (2016) discovered that the gratitude intervention resulted in increased sleep quality along with decreased diastolic blood pressure; Kim-Godwin et al.'s (2020) study indicated that the journaling intervention led to a statistically significant reduction in systolic blood pressure.

However, Moieni et al. (2018) demonstrated no significant effect of the gratitude intervention on inflammatory markers; Jackowska et al. (2016) found no significant effects on cortisol levels or heart rate; Bai et al. (2019) did not observe an improvement in sleep quality compared to the control group; and in Salzman et al.'s (2018) study, the gratitude group did not exhibit a reduction in cortisol levels compared to the control groups.

Another noteworthy category of outcomes identified in our review pertained to work or academic-related aspects, encompassing four studies (4.9%). Once again, results in this domain proved inconsistent, with certain studies indicating enhancements in career satisfaction (Caragol et al., 2021), employee well-being (Neumeier et al., 2017), and student motivation (Valdez et al., 2021), while others reported no significant improvements in work engagement (Komase et al., 2019) or job-related affective well-being, negative job-related affective well-being, or job stress (Winslow et al., 2016). Yet again, the outcomes display a notable lack of consistency, and the studies are too limited to permit the formulation of any definitive conclusions.

While the majority of studies included in our scoping review were randomized controlled trials (n=48, 59.2%), there were also several pre-post studies (n=12, 14.8%), a factor that should be considered when examining the results.

4.3 Gaps in the literature

Our study revealed that gratitude studies primarily targeted populations comprising women, college students, and individuals in good health. We recommend that future research shifts its focus to include elderly individuals, those with comorbidities, and men.

Furthermore, a noteworthy observation was that the majority of studies took place outside clinical settings, led by researchers rather than clinicians. We propose that clinicians, particularly those in primary care, engage in more gratitude research.

While the studies analyzed predominantly explored psychological outcomes, it is essential to acknowledge the multidimensional nature of health (bio-psycho-social). Regrettably, there is a paucity of literature on gratitude's impact on physical health. Therefore, it would be beneficial for future research to incorporate studies that assess physical health outcomes.

Although there were no studies specifically dedicated to examining the cost-effectiveness of gratitude interventions, those studies addressing costs portrayed them as an advantage of these interventions. It would be intriguing to see studies that delve deeper into the cost-effectiveness of implementing gratitude interventions across various settings, such as clinical and academic environments.

4.4 Strengths

The current study has several notable strengths. Firstly, our review stands out as an initial comprehensive exploration of knowledge concerning gratitude interventions, encompassing a wide range of articles.

Secondly, our scoping review meticulously maps out a substantial portion of the literature related to gratitude interventions. We conducted searches across four distinct databases and in four different languages, yielding a collection of 81 articles spanning the past two decades. This approach provides a comprehensive overview of the available evidence, incorporating a significant number of randomized controlled trials.

Thirdly, this study adhered to a transparent methodology, registered on the Open Science Framework (OSF). The research algorithm was developed in collaboration with an experienced university librarian. To enhance accuracy, two independent reviewers screened, extracted, and analyzed the included articles, overseen by two experienced researchers.

4.5 Limitations and future implications

Our study has several limitations. The first is linked to the inherent nature of scoping reviews, which typically do not involve critical appraisal of individual sources of evidence. Consequently, we did not assess the methodological quality of the included studies, nor did we examine the risk of bias, potentially raising validity concerns and leading to misleading conclusions. As a recommendation, we propose the undertaking of additional reviews centered on the concept of gratitude and gratitude interventions. Specifically, we suggest conducting systematic reviews that scrutinize the impact of gratitude interventions on the health of individuals.

Additionally, our review might not have captured the latest trends from gray literature, as it was not included, and the research's cutoff date was May 2023. Subsequent studies conducted beyond this date may provide novel insights.

The second limitation arises from the geographical distribution of the included studies, predominantly conducted in North America (45.7%) and Europe (20.8%). The scarcity of studies from other continents could limit the generalizability of our results. Furthermore, most participants in these studies were women and college students, potentially restricting the applicability of findings to diverse countries, socioeconomic backgrounds, and age groups. Future studies with more extensive and diverse samples are warranted.

Additionally, most studies were carried out by researchers outside clinical settings, raising concerns about the generalizability of results to patients. Notably, we did not find evidence of studies conducted by primary care doctors. Despite these limitations, the review provides valuable insights into the current state of research in the gratitude field.

In the context of clinical practice, it is advisable to regard gratitude interventions, for the time being, as a preventive measure or a supplementary tool in conjunction with other therapeutic approaches, aligning with the current insights available in scientific literature.

The implementation of gratitude interventions should be individualized, adopting a patient-

centered approach, as emphasized by Professor Alain Moreau (68). To address issues related to adherence, it is crucial to strategically integrate the intervention into the patient's life, aligning with the principles outlined in the Prochaska and DiClemente approach (78).

This review underscores the potential of gratitude as a preventive measure for enhancing psychological well-being. However, its application should be approached judiciously, adhering to patient-centered principles to minimize the risk of treatment delays.

Creating a guide for prescribing gratitude in clinical practice, especially for general practitioners, could prove beneficial. Collaborative efforts involving a network of experts, employing methodologies such as the Delphi technique (99), can play a pivotal role in validating and refining the recommendations for gratitude intervention.

5. Conclusion

The objective of this scoping review was to explore the effects on the health of patients prescribed gratitude-stimulating interventions. Our review identified 81 studies describing various forms of gratitude-centered interventions, with a predominance of North American studies, representing nearly 50% of the research. Our results highlighted a growing interest in gratitude in the literature, with an acceleration of research after 2017.

Our review also underscores an increasing use of new technologies, utilizing the internet or mobile applications. Regarding the studied population, we observed a predominant participation of individuals with a high level of education, such as university students, teachers, or healthcare professionals. Moreover, a majority of young women were noted in the studied populations. Additionally, the studies mainly focused on psychological rather than physical criteria.

While qualitative and mixed-methods studies indicated good feasibility and tolerance of gratitude interventions, it appears challenging to generalize these initial experiences to the general population, notably due to a lack of inclusion of male, vulnerable, or elderly populations in the included publications.

Thus, it seems worthwhile to deepen our understanding of gratitude interventions to better integrate these practices into primary care. Our study emphasizes the need to educate healthcare professionals about gratitude-based interventions and encourages the conduct of studies in hospital or primary care settings, especially with general practitioners.

In this context, this scoping review opens up future prospects for new gratitude-based interventions, showing promising results and high acceptability.

Conclusion de la thèse

L'objectif de cette scoping review était d'explorer les effets sur la santé des patients à qui sont prescrits des interventions stimulant la gratitude. Notre revue a identifié 81 études décrivant différentes formes d'interventions centrées sur la gratitude, avec une prédominance d'études Nord-Américaines, qui représentent près de 50 % des recherches. Nos résultats ont mis en lumière un intérêt croissant pour la gratitude dans la littérature, avec une accélération de la recherche après 2017.

Notre revue souligne également une augmentation de l'utilisation des nouvelles technologies, utilisant internet ou des applications mobiles. En ce qui concerne la population étudiée, nous avons observé une participation prédominante de personnes ayant un niveau de formation élevé, telles que des étudiants universitaires, des enseignants ou des professionnels de santé. De plus, une majorité de femmes jeunes a été constatée dans les populations étudiées. Aussi, les études ont principalement porté sur des critères psychologiques plutôt que physiques.

Bien que des études qualitatives et mixtes aient indiqué une bonne faisabilité et tolérance des interventions de gratitude, il semble difficile d'étendre ces premières expériences à la population générale, notamment à cause d'un manque d'inclusion de populations masculines, précaires ou âgées dans les publications incluses.

Ainsi, il semble intéressant d'approfondir les connaissances à propos des interventions de gratitude, afin de mieux intégrer ces pratiques dans les soins primaires. Notre étude souligne la nécessité d'informer les professionnels de santé sur les interventions basées sur la gratitude et d'encourager la réalisation d'études dans des milieux hospitaliers ou en soins primaires, en particulier avec les médecins généralistes.

Dans cette optique, cette scoping review ouvre des perspectives futures pour de nouvelles interventions basées sur la gratitude, avec des résultats encourageants et une acceptabilité élevée.

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Annexes:

Annexe 1: Equations de recherche

Equation de recherche utilisée pour Web of Science:

((TS=(gratitude intervention*)) AND TS=(health*)) AND TS=(effect* OR efficac* OR "action of" OR benefit* OR result*)

Equation de recherche utilisée pour Pubmed:

((gratitude intervention*[Title/Abstract]) AND ((((((effect*[Title/Abstract]) OR (result*[Title/Abstract])) OR (benefit*[Title/Abstract])) OR ("action of"[Title/Abstract])) OR (efficac*[Title/Abstract]))) AND ((health[MeSH Terms]) OR (health*[Title/Abstract]))

Equation de recherche utilisée pour PsycInfo

tiab(gratitude intervention*) AND tiab(health*) AND tiab(effect* OR efficac* OR 'action of' OR benefit* OR result*)

Equation de recherche utilisée pour Embase

('gratitude intervention*'): ab, ti AND [(effect*) ab, ti OR (efficac*): ab, ti OR ('action of'): ab, ti OR (benefit*): ab, ti] AND ('health')/exp

Annexe 2 : Échelles de gratitude

Annexe 2.1: Gratitude Questionnaire (GQ-6)

The Gratitude Questionnaire – Six Item Form (GQ-6)

The Gratitude Questionnaire-Six-Item Form (GQ-6) is a six-item self-report questionnaire designed to assess individual differences in the proneness to experience gratitude in daily life.

McCullough, M. E., Emmons, R. A., & Tsang, J. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology*, 82, 112-127.

Instructions: Using the scale below as a guide, write a number beside each statement to indicate how much you agree with it.

- 1 = strongly disagree
- 2 = disagree
- 3 = slightly disagree
- 4 = neutral
- 5 = slightly agree
- 6 = agree
- 7 = strongly agree

- ____ 1. I have so much in life to be thankful for.
- ____ 2. If I had to list everything that I felt grateful for, it would be a very long list.
- ____ 3. When I look at the world, I don't see much to be grateful for.
- ____ 4. I am grateful to a wide variety of people.
- ____ 5. As I get older I find myself more able to appreciate the people, events, and situations that have been part of my life history.
- ____ 6. Long amounts of time can go by before I feel grateful to something or someone.

Scoring: Compute a mean across the item ratings; items 3 and 6 are reverse-scored.

Annexe 2.2: The Gratitude Adjective Checklist (GAC)

The Gratitude Adjective Checklist (GAC)

The GAC is a three- item measure comprised of the sum of affect adjectives: grateful, thankful, and appreciative. It can be framed over short or longer time, by varying the time specified in the instructions, e.g. right now, think about “yesterday”, or think about “the past few weeks.”

McCullough, M. E., Emmons, R. A., & Tsang, J.-A. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology*, 82(1), 112–127. doi:10.1037//0022-3514.82.1.112

Instructions: Think about how you [felt yesterday/have felt during the past few weeks]. Using a scale from 1 (not at all), 2 (a little), 3 (moderately), 4 (quite a bit), to 5 (extremely), please choose a number to indicate your level of feeling the following:

- _____ 1. Grateful
- _____ 2. Thankful
- _____ 3. Appreciative

Scoring: Sum responses to the 3 items.

Annexe 2.3: Gratitude Resentment and Appreciation Scale (GRAT) –Short Form

Gratitude Resentment and Appreciation Scale (GRAT) – Short Form

The GRAT-Short Form is a 16-item scale designed to measure an individual's dispositional gratitude.

Watkins, P. C., Woodward, K., Stone, T., & Kolts, R. L. (2003). Gratitude and happiness: Development of a measure of gratitude, and relationship with subjective well-being. *Social Behavior & Personality: An International Journal*, 31, 431-452.

Instructions: Please provide your honest feelings and beliefs about the following statements which relate to you. There are no right or wrong answers to these statements. We would like to know how much you feel these statements are true or not true of you. Please try to indicate your true feelings and beliefs, as opposed to what you would like to believe. Respond to the following statements by circling the number that best represents your real feelings. Please use the scale provided below, and please choose one number for each statement (i.e. don't circle the space between two numbers), and record your choice in the blank preceding each statement.

1	2	3	4	5	6	7	8	9
I strongly disagree		I disagree somewhat		I feel neutral about the statement		I mostly agree with the statement		I strongly agree with the statement

- _____ 1. I couldn't have gotten where I am today without the help of many people.
- _____ 2. Life has been good to me.
- _____ 3. There never seems to be enough to go around and I never seem to get my share.
- _____ 4. Oftentimes I have been overwhelmed at the beauty of nature.
- _____ 5. Although I think it's important to feel good about your accomplishments, I think that it's also important to remember how others have contributed to my accomplishments.
- _____ 6. I really don't think that I've gotten all the good things that I deserve in life.
- _____ 7. Every Fall I really enjoy watching the leaves change colors.
- _____ 8. Although I'm basically in control of my life, I can't help but think about all those who have supported me and helped me along the way.
- _____ 9. I think that it's important to "Stop and smell the roses."
- _____ 10. More bad things have happened to me in my life than I deserve.
- _____ 11. Because of what I've gone through in my life, I really feel like the world owes me something.
- _____ 12. I think that it's important to pause often to "count my blessings."
- _____ 13. I think it's important to enjoy the simple things in life.
- _____ 14. I feel deeply appreciative for the things others have done for me in my life.
- _____ 15. For some reason I don't seem to get the advantages that others get.
- _____ 16. I think it's important to appreciate each day that you are alive.

Scoring:

The following items should be reverse scored: 3, 6, 10, 11, 15.

The following items form the Lack of a Sense of Deprivation (LOSD) factor: 2, 3, 6, 10, 11, 15.

The following items form the Simple Appreciation (SA) factor: 4, 7, 9, 12, 13, 16.

The following items form the Appreciation for Others (AO) factor: 1, 5, 8, 14.

Total is from all items.

Nom, prénom du candidat : DA ROCHA MIRANDA Maria

CONCLUSIONS

L'objectif de cette scoping review était d'explorer les effets sur la santé des patients à qui sont prescrits des interventions stimulant la gratitude. Notre revue a identifié 81 études décrivant différentes formes d'interventions centrées sur la gratitude, avec une prédominance d'études Nord-Américaines, qui représentent près de 50% des recherches. Nos résultats ont mis en lumière un intérêt croissant pour la gratitude dans la littérature, avec une accélération de la recherche après 2017.

Notre revue souligne également une augmentation de l'utilisation des nouvelles technologies, utilisant internet ou des applications mobiles. En ce qui concerne la population étudiée, nous avons observé une participation prédominante de personnes ayant un niveau de formation élevé, telles que des étudiants universitaires, des enseignants ou des professionnels de santé. De plus, une majorité de femmes jeunes a été constatée dans les populations étudiées. Aussi, les études ont principalement porté sur des critères psychologiques plutôt que physiques.

Bien que des études qualitatives et mixtes aient indiqué une bonne faisabilité et tolérance des interventions de gratitude, il semble difficile d'étendre ces premières expériences à la population générale, notamment à cause d'un manque d'inclusion de populations masculines, précaires ou âgées dans les publications incluses.


Ainsi, il semble intéressant d'approfondir les connaissances à propos des interventions de gratitude, afin de mieux intégrer ces pratiques dans les soins primaires. Notre étude souligne la nécessité d'informer les professionnels de santé sur les interventions basées sur la gratitude et d'encourager la réalisation d'études dans des milieux hospitaliers ou en soins primaires, en particulier avec les médecins généralistes.

Dans cette optique, cette scoping review ouvre des perspectives futures pour de nouvelles interventions basées sur la gratitude, avec des résultats encourageants et une acceptabilité élevée.

Le Président de jury,
Nom et Prénom
Signature
SCHOTT Anne-Marie



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Le Doyen de la Faculté de Médecine
et de Maïeutique Lyon-Sud Charles Mérieux



Professeur Philippe PAPAREL
Vu et permis d'imprimer
Lyon, le 13/12/2023

DA ROCHA MIRANDA Maria et CHRIV Valentin

Effets des interventions de gratitude sur la santé des patients : une étude de la portée

Thèse Médecine Générale : Lyon 2024 ; n°006

RESUME

Contexte : Les médecins généralistes font face à un nombre croissant de patients en demande de prise en charge en santé mentale. Les interventions non pharmaceutiques en soins primaires, telles que la prescription d'exercices stimulant le sentiment de gratitude, semblent être une alternative ou un complément aux traitements pharmaceutiques des troubles mentaux les plus courants.

Objectif : Une scoping review ou étude de la portée a été réalisée pour décrire l'étendue des connaissances et des preuves disponibles sur les interventions de gratitude, clarifier les concepts clés, identifier les lacunes de connaissance et décrire les applications pratiques de la gratitude en santé.

Méthodes : Des recherches ont été effectuées sur les bases de données MEDLINE, Web of Science, Embase et PsycInfo en mai 2023 afin d'identifier les études pertinentes, qui ont été analysées conformément aux directives de l'extension PRISMA pour les revues de la portée. **Résultats :** 81 études ont été incluses. L'Amérique du Nord semble être le continent le plus représenté, contribuant à 45.7% des études incluses. La forme prédominante d'intervention de gratitude impliquait l'utilisation de journaux ou de listes de gratitude. Les participants à ces études provenaient majoritairement d'un haut milieu socioculturel et étaient principalement de sexe féminin. Les critères de jugement étudiés étaient plutôt psychologiques que physiques.

Conclusion : Les interventions de gratitude semblent être un outil prometteur en termes de prévention. De futures recherches sont à mener sur l'utilisation de la gratitude en soins primaires et en milieu hospitalier, impliquant d'autres professionnels de santé, dont les médecins généralistes.

Mots clés : Gratitude, intervention, psychologie positive, santé mentale, santé physique

JURY :

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