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# A systematic review and meta-analysis to evaluate the effectiveness of physical and behavioral intervention on community dwelling older adult's well-being

Rashida Bibi [a,b,*], Zhang Yan [c], Hamayun Khan [c], Fath ur Rahman [c], Nahed Ahmed Hussien [d], Imtiaz Alam [a]

[a] *Institution of Nursing and Health, Zhengzhou University, Zhengzhou, Henan 450000, China*
[b] *Naseem Nursing Institute and Public Health School, Peshawar, Khyber Pakhtunkhwa, Pakistan*
[c] *School of Nursing and Health, Zhengzhou University, Zhengzhou, Henan 450000, China*
[d] *Faculty of Nursing, Suez Canal University, Ismailia, Egypt*

## ARTICLE INFO

## ABSTRACT

*Background:* Several lines of gerontology researches support the efficacy of physical activity, and behavioural modification interventions in a large population. However, the true impact of this kind of intervention on the subjective well-being of community-based older adults is still unknown. The purpose of this study was to evaluate the true effects of physical, and behavioral interventions on the subjective well-being (WB) of high-risk older adults.

*Methods:* The search process was carried out from January 2023 to May 2023; following databases were searched to pool all the relevant scientific papers: PubMed (Web of Science (1950–January 2020), Medline (2006–2021), Scopus (1978–2022), Springer (2008–2020), Science Direct (1978–2021), Google Scholar (2010–2020), and Mandalay (2014–2023). Checking the reference lists; searching for ongoing trials and research registers; and performing manual searches. Two independent authors did this, and a third independent author tested the data extraction. We adopted the PRISMA guidelines.

*Results:* The review included 12 randomized controlled trials (RCTs) with 2037 community-based older adults. The overall effect size of physical, and behavioral interventions on the overall subjective WB of community based older adults was −0.0274 (95 % CI: −0.6697 to 0.8950), which was statistically significant (Z = 0.03752, p.0.02075). Five studies had shown statistically significant improvements in Quality Of life (QOL) scales in the intervention group compared to the control group

*Conclusion:* Physical, and behavioral intervention when blended together improve the WB of community based high-risk older adults. Further research with appropriate randomization, and allocation maybe needed.

## 1. Introduction

The global population is undergoing major demographic changes, with an increasing number of older persons (Arias-Merino et al., 2012; Rubenstein et al., 2011). This change brings both opportunities and challenges to society (Paúl et al., 2012). Previous research has shown that older adults tend to have poor well-being and quality of life. However, the concept of active aging emphasizes to improving subjective well-being (SWB) of older adults to remain independent, and contribute to their communities (Paúl et al., 2012). Various

organizations, including the World Health Organization (WHO), the International Council on Positive Ageing (ICAA), and the American Society on Aging (ASA), promote the physical, and behavioral health of older adults by focusing on social, cognitive, and emotional activities to promote subjective well-being.

SWB can be defined as a person's cognitive and affective evaluations of his or her life, physical, emotional, social, and psychological health (Kapan et al., 2017). A high level of SWB, often equated with being very happy, is characterized by strong life satisfaction, limited negative emotions, and rate high quality of life (WHO, 2002). This understanding

aligns with the 'hedonic' perspective of well-being, which emphasizes maximizing pleasure and in contrast, the 'eudaimonic' perspective, which emphasizes living authentically according to one's true self, focusing on life's meaning and self-realization, and the degree of integration of these aspects into one's life. Sub-well-being (SWB) can be maximized by increasing participation in social, leisure, and learning activities and, if necessary, adapting to new roles (Bartholomaeus and Agteren, 2019). Many studies have explored the relationship between participation in informal and formal education learning activities with SWB, leading to a growing interest in active aging interventions. This review aimed to conduct a systematic review to assess the impact of physical and behavioral-focused interventions on the SWB of older adults living in communities.

### 1.1. Community based wellbeing activities

Improving well-being in older adults has gained attention beyond gerontology, focusing on well-being, contentment, and life satisfaction in old age (Paúl et al., 2012). In gerontology, happiness is seen as a response to "active aging." The subjective counterpart of the more public assessment. Various definitions and measures are used in gerontology literature, including life satisfaction, positive emootions and quality of life (Franzke et al., 2018; Kirilov et al., 2018). As individuals age and physical health become more important, leading to subjective wellbeing indicators such as subjective rating of own life satisfaction, quality of life and affct being used in studies that explore the relationship between physical activities, behavior, and happiness. Some longitudinal studies even use time before death as an objective measure of the impact of activity participation on later life. While survival and longevity are not direct components of subjective well-being, they are closely related to gerontology, and positive psychology researches (Vailati Riboni et al., 2020).

Physical activities, and behavioral modofication strategies play a vital role in promoting the overall well-being of older adults. Physical activity is a key determinant of improved well-being, prevent disability, and mental health problems. Community-based activities focus primarily on participants' participation in fun based physical activities such as line dancing, laughter therapy, and touring, group walk, and chair game can reduce symptoms of depression and anxiety, enhance self-esteem, and improve life satisfaction (Zanjani et al., 2012). Participation in active aging intervention programes provides opportunities to learn new skills, change behavior, improve resilience, efficacy, social interaction, and fosters a sense of belonging and connectedness, which are crucial for maintaining positive wellbeing, and quality of life (Carr et al., 2017).

Studies have shown that regular physical activity, and healthy lifestyle habits improve overall well-being in older adults. Exercise, along with a healthy diet, has been linked to better physical and cognitive function in older adults (Franzke et al., 2018). Higher levels of life satisfaction, positive impact, and life purpose were also associated with better physical function and reduced disability in older adults (Escolar Chua & de Guzman, 2014). Economic security in old age is considered a fundamental determinant of well-being, as is better access to health care services, increased participation in leisure activities (Kirilov et al., 2018). Understanding physical activity, and behavioral modification strategies is essential to promote the well-being of older adults and improve quality of life.

Community-based aging-related education programmes have a significant impact on the development of sustainable intervention strategies and policies to improve the SWB of aging populations. These programmes, such as lifelong learning opportunities, educational workshops, social clubs, intergenerational programmes, volunteer opportunities, and mindfulness therapy, are effective in promoting active aging and quality of life for older adults. A study found that physical activity,and emotional health is associated with overall well-being among older adults (McPhee et al., 2016). A systematic review by

Thais Abud (2022) demonstrated that exercises, and a healthy diet, rich in fruits, vegetables, whole grains, and lean proteins were associated with better physical and mental function in older adults (Abud et al., 2022). Participation in active aging interventions provides older adults with opportunities to learn new skills, change behaviors, build resilience, engage in social interactions, and foster a sense of belonging and connection, all of which contribute to positive well-being and quality of life (WHO, 2002). A longitudinal study by Steptoe, and an analytical study by Borbon (Borbón-Castro et al., 2020; Steptoe et al., 2014) revealed that higher levels of life satisfaction, positive affect, and purpose in life were associated with better physical health and reduced disability in older adults (Zhao et al., 2020), better mental well-being in older adults(Tajvar, 2016),and improved social participation(Beard et al., 2016). Social support programmes have been found to increase social participation, reduce social isolation. In addition, financial literacy programmes for seniors (Durham, NC, USA: United States Environmental Protection Agency, n.d.) have had a positive impact on SWB (Chen et al., 2018). Subjective well-being (SWB) in old age does not necessarily decline, and may even improve in some cases. SWB includes cognitive assessments of life satisfaction and emotional experiences, while Physical Well −being (PWB) includes aspects such as autonomy, mastery, personal growth, life goals, positive relationships, and self-acceptance that measure quality of life(QOL). Education and social relations have a significant impact on PWB (Lampit et al., 2014), and leisure based intervention programmes on SWB in older adults (Bennett & Hackney, 2018; Gonot-Schoupinsky & Garip, 2018).

Gerontologists propose that social and leisure participation can promoting the SWB of older adults through exercise, stimulation of physical and mental health, and opportunities for a healthy lifestyle. This community-based intervention is intuitively attractive, but it is unclear whether certain physical, and behavioural focused activities are beneficial for wellbeing in old age. By synthesising the available evidence, the study was aimed to examined the effect of physical, and behavioral based intervention for subjective well-being and identify areas of participation, methods used to measure activities in later life, and evidence for the relationship between community based active aging activities and subjective well-being in old age.

## 2. Materials and methods

Search strategy: The search strategy of the review was carried out through the PubMed search strategy, and Parish systematic review software, using key words such as (physical, behavioural, wellbeing, older adults, community based, and and Boolean operators such as (AND, OR).

Search process: The search process was carried out from January 2023 to May 2023, following databases were searched to pool all the relevant scientific papers: PubMed (Web of Science (1950–January 2020), Medline(2006–2021), Scopus (1978–2022), Springer (2008–2020), Science Direct (Google Scholar (2010–2020), Mandalay (2014–2023) The Perish searching engine was used to excess Scopus, Mandalay, and Google Scholar data, all of which was exported to a RIS file for record.

Searched other data sources: To complete the systematic search, the bibliography lists of included studies were reviewed to identify additional studies meeting the selection criteria. A manual search of different journals was carried out. The search results are presented in (Fig. 1).

### 2.1. Eligibility check

Inclusion and Exclusion Criteria: (1) The criteria of population, intervention, comparison, and outcome (PICO) reporting structure were followed. (1) The population was older adults age 60 and above;(2) living in the community and nursing homes; (3) community based non–pharmacological intervention programmes for active aging, and (3) older adults either receiving only health education or usual daily living.
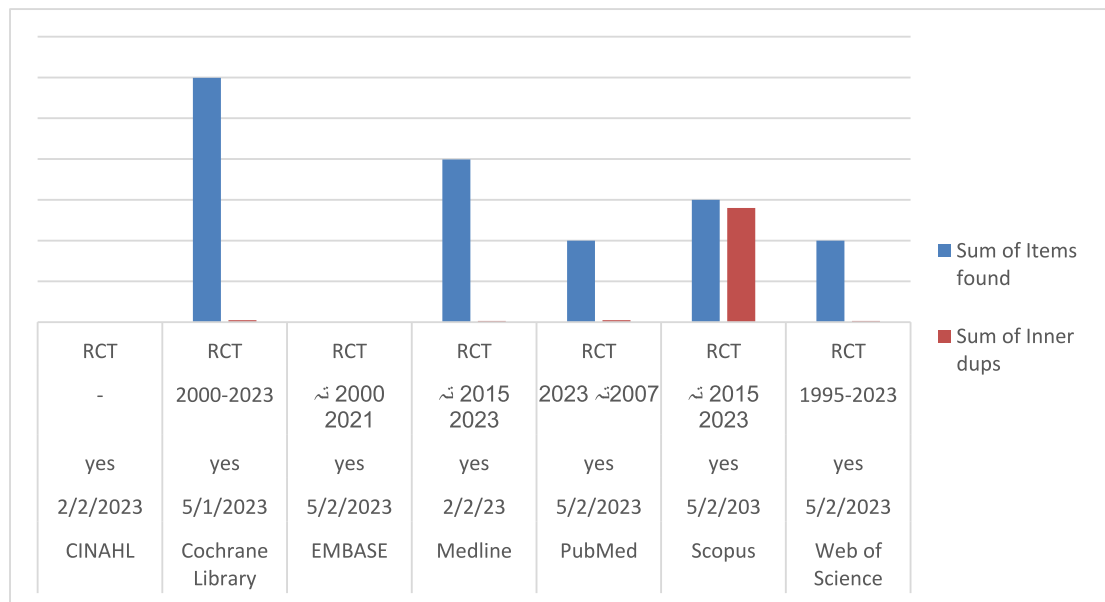
**Fig. 1.** Searched results for the review *Note: Search result indicated that most of the data bases retrieved duplicated studies.*

Study selection: The criteria included in this review were that the study had to use measures of physical activity, and behavioural therapy based interventions in relation to other variables, focusing on subjective well-being (e.g., life satisfaction, quality of life (QOL), and positive affect). The study investigators included a randomised control trial, and longitudinal studies used statistical covariates and/or grouping variables to control the effects of sociodemographic attributes or other variables that may be relevant to well-being. Finally, the study investigators did not include the growing literature on the effects of activity participation on cognitive function (or, conversely, dementia) because the study investigators thought that measures of cognitive ability were quite different from subjective well-being. The study investigators followed the Preferred Reporting Items for Systematic Reviews and Meta- Analyses Guidelines (PRISMA) (Buyl et al., 2020; Liberati et al., 2009) and the recommendations of the Cochrane Collaboration (Higgins et al., 2011).

Exclusion criteria were: (1) studies that included intervention combinations with medical interventions; (2) Those studies that did not
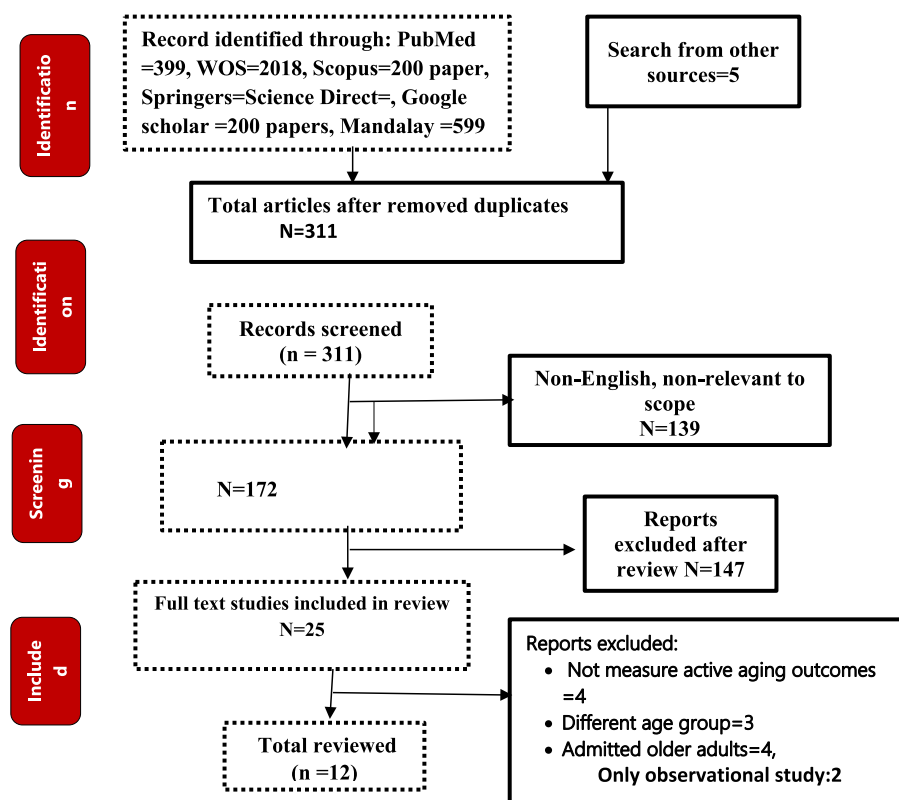


**Fig. 2.** PRISMA flow chart of studies selection **Note: Most of the studies were excluded due to non-English, unavailability of full text articles, and different outcome variables were measures in some of the studies.**

apply a reliable measuring tool for outcome measurement; and (3) Studies that did not clearly mention all the methodological procedures. Due to the new scope of the geriatric field, and the heterogeneity of the concept, we limited our focus to exclude (1) papers published in languages other than English and Urdu and (2); studies that must empirically investigate the effects of structured education programmes for active aging among older adults. We decided to search experimental studies, longitudinal studies, and quasi-experimental studies for the review to identify all the active aging programmes in the literature. The screening results and reasons for the exclusion of the full text screening stage are reported in the PRISMA flow chart in (Fig. 2). After the database search and selection process, we read all selected studies in their entirety and coded them according to several key methodological characteristics: sample size and composition; study design; leisure based, engagement based, and learning based interventions; outcome variables related to well-being(life satisfaction, quality of life, depression, and subjective wellbeing).

### 2.2. Data extraction

Data were independently extracted from included studies by keeping in mind the PICO model (population, intervention, control group, and outcome) by two reviewers (RB, MI). Disagreement was resolved by discussion and/or by a senior author (ZY). The authors (RB,H.K, and F. R) reviewed the full text papers for authorships, countries, date of publication, study design, inclusion and exclusion criteria, sample size, sample size selection method, study population characteristics, mean age at intervention baseline, community based programmes for active aging, intervention structure, theoretical basis, duration of intervention, number of follow-up visits, active aging assessment method, applied scales, trainers, and therapists, which were all extracted from the 12 articles. The extrcated data was rechecked by(N.A,RB,ZY) to revive embeguity if found.

Selection of the studies for review: All searched data from different databases was exported from Parish's database searching software and saved as ARIS files. All the files were then exported to EPPI (a free web-based software programme developed by the Evidence for Policy and Practise Information and Co-Coordinating Centre (EPPI) at the Institute for Education, London) where the study investigators managed to remove reduplicated papers. The search yielded 363 research papers, of which 62 duplicates were eliminated. The first and third authors (RB& ZY) checked the remaining papers for titles and abstracts to determine their relevancy and appropriateness. Next, two researchers (ZY and H.K) recorded the reasons why full texts were excluded based on insufficient information for judgment. Conflicts were settled cordially with a fourth reviewer (MI). PRISMA guidelines were followed (Vailati Riboni et al., 2020). If an article measured improvement in WB, negative emotions, life satisfaction, and quality of life as a result of intervention given to individuals and groups by health care providers or community peer groups and volunteers, After carefully examining the full contents of the papers, the researchers eliminated 10 further studies because (1) they used another language, three (2) Four did not examine how intervention programmes resulted in older adults wellbeing; and (3) the participants were under the age of 60 (Reshma et al., 2021). Total of 12 articles met the inclusion criteria were retained.(see Fig. 2).

### 2.3. Assessment of risk of bias in included studies

Two reviewers (RB and ZY) independently examined the risk of bias for each of the selected studies using the Cochrane Collaboration Risk of Bias Tool. Disagreement was resolved by involving a third reviewer (N. B). The study investigators contacted the authors in order to obtain any missing data. Data extraction included the following information: (1) publication details: author, year, country; (2) study characteristics: total number of participants, mean age of participants, type, and stage of cancer; (3) Intervention design: Content of the intervention, duration of

intervention, total number of sessions, duration of each session; (4) outcomes: Type of outcome to be measured; timing, frequency, and duration of follow-up for each outcome; outcome measurement tool.

Risk of bias across studies: The risk of publication bias was minimised by searching international trial registries and PROSPERO's references search. In addition, the study investigators attempted to contact the study authors to ask them to provide the missing outcome.

### 2.4. Data analysis and narrative synthesis

The studies were first examined to describe the intervention and qualitative synthesis. Intervention components are listed, followed by narrative synthesis. A narrative synthesis was performed to synthesise the results of the collected research. Finally, described and integrated the results. In addition, similarities were investigated in the review text and differences were explored between the results of different studies and the exploration of patterns in data based on population and comparative characteristics, interventions, outcomes, and exploring relationships.

### 2.5. Statistical analysis

The Effect size (ES) and 95 % confidence interval (CI) for primary and secondary outcomes were calculated. The effect size was obtained by combining the sum of the mean scores (SMS) and the standard deviation (SD) between intervention and control groups (P 0.05), which is considered statistically significant. The explanation for ES is small if value is below 0.2, medium if value is between 0.21 and 0.5, and large if value is above 0.80 (Liberati et al., 2009). Statistical heterogeneity was assessed using the I2 statistic. A value of I2 > 50 % indicates large heterogeneity. A non-random-effects model was used to explain the effect size using the inverse variance statistical method for high heterogenetic values, and a random-effects model was used to explain the changes. Forest plots were used to show pooled effect size (95 % CI). JAMOVI software and ROB spread sheets were used for statistical analyses (available online in a free version).

### 2.6. Subgroup analysis

Subgroup analysis was performed to determine which features affect overall effect size (ES). These analyses determine: The impact of methodological features was studied (Intervention method, duration of intervention, comparison, status, modality, and type of intervention).

Participant's characteristic: The number of participants in the studies ranged from 40 (Sia et al., 2020) to 628 (Kim et al., 2023). The total sample size in the review was 2037. The sampling strategy of most studies (n = 8) was simple randomization; Three studies used block algorithms and multichannel stratified sampling; and one study did not specify the sampling strategy Participants' average age ranged from 66 years (SD not given) to 83 years (SD 1.4), with heterogeneity across demographics, including age, gender, education, income, health status, mental status, living arrangements, and nationalities. (See Table 1). Most studies had a sample size greater than 50 and were predominantly conducted in China and Singapore (Klainin-Yobas et al., 2019; Li et al., 2022; Sia et al., 2020; Chi and Chen-Long, 2021). Ten studies were carried out on both genders, and two were solely on females (Klainin-Yobas et al., 2019; Li et al., 2022; Sia et al., 2020; Chi and Chen-Long, 2021). The majority of participants were above sixty-five years of age. Three studies were conducted on people with specific conditions or circumstances, such as frailty (Escolar Chua & de Guzman, 2014), lower limb disability, and nonclinical depression (Sajjasopho, 2013; Sia et al., 2020).

**Study quality.** The majority of studies laid out their goals and objectives in detail, defined the environment in which the research was conducted, made sure that the sample size was adequate to be representative of the population, explained how the data was collected, and

**Table 1**

Characteristics of reviewed studies.

| Author/Year/ Country | Purpose | Sample/ study duration | Method | Major Findings | Critical Appraisal |
|---|---|---|---|---|---|
| Ghodsbin 2014, Iran | "To evaluate the effect of laughter therapy for general health and mental wellbeing of older adults in the community | Sample: 40,I = 20,C = 20 Age: > 60 years I = Male (n = 12 and female (n = 28 %) I = laughter therapy C = usual care Sampling: Simple Randomization Participants: Iranian older adults Study duration: 6 weeks 90 min/2/week | Design: RCT Theoretical framework: Not provided Setting: Community based Data collection method: General health survey, Depression scale(GDS-15) Data analysis: SPSS,V.17 | Barriers Laughter therapy help in improving general health perception and reduce depressive symptoms Facilitators Volunteer nurse and psychologist | Strengths Trail registered. Randomization, used validated tools, quality control, comprehensive discussion Limitations Limitations Lack of description of data analysis techniques, and no discussion about researcher reflexivity. Quality Rating Good |
| Kappan 2017 Austria | To evaluate the effects of a lay-led home-based physical and nutritional intervention programme with social support alone on different QoL domains in community-dwelling pre-frail and frail older adults. | Sample: 79 Austrian olderIntervention (lay leaders support home based exercises, and nutrition education, I = 41,C = 38 Intervention time = 2 visit/ week39 adults, Female(n = 33 M(n = 8),C = 39, Control group = social support, Age: Mean(74 ± 6.3) Participants = community based Sampling: Randomized Study duration = 12 weeks Timing = 2 time/week | Design: Qualitative Descriptive Theoretical framework: health believe model. Setting: Community setting Data collection method: WHOQOL-BREF, WHOQOL-OLD Data analysis: Linear regression, ANNOVA, descriptive statistic | Lay leader home based intervention for physical and nutritional education improve QOL in older adults. Facilitators Family members, and volunteers | Strengths Appropriate study design, reasonable sample size, valid data collection tools, adequate data analysis approach, Training to lay leaders. Limitations Limitations Dropout rate not mentioned Quality Rating Good |
| Scolar, et al. 2013, Filipine | The purpose of this study was to assess the effect of third age learning program on quality of life and mental health of older adults in Philippine older adults | Total = 40 Sample: I = 20,C = 20 Setting= Community based male (n = 13) and female (n = 7) Age: mean 68 ± 5.4 participants: Community dwellers Sampling: Randomized. Study duration: 12 weeks | Design: experimental Setting: Community Data collection method:,LSITA-SF Data analysis: Framework analytical approach | Active aging education based on exercises, diet and aging literacy improve life satisfaction and decrease depressive symptoms. Leisure based informal learning platform improve older adults internal satisfaction | Strengths Appropriate study design, well written protocol, appropriate method to select sample size, Quality control was maintained. Limitations Limitations Small sample size to generalize Quality Rating Medium |
| Korravarn Yodmai, 2021 Thailand | The aimed of this study was to assess the effects of health promotion among older adults using an aging family network program to reduce depression and improve quality of life (QOL) among older adults. | Sample: I = 55,C = 55 Setting= Community based, I = male (n = 12) and female (n = 43) C (M = 14,F = 41) Age: mean 68 ± 7.4 participants: Community dwellers Sampling: Simple randomization, Study duration: 12 months | Design: experimental(RCT) Setting: Community Data collection method: WHOQOL-OLD,DDS Data analysis: regression model, T.TEST, ANNOVA. | Using family members can improve social support and perception of health care from family members, reduce depression, and can improve the overall QOL | Adequate sampling, sampling method was satisfactory, not mentioned any theoretical framework. Quality rating = good |
| Li et al. 2022 China | This study aimed to explore the efficacy of group reminiscence therapy based on Chinese traditional festival activities (CTFA-GRT) to mediate the loneliness and perceived stress of older adults living alone in rural China. | Total = 60 Sample: I = 30,C = 30 Setting= Community based, I = male (n = 12) and female (n = 18) C (M = 10,F = 20) Age: mean 65 ± 3.4 participants: Community dwellers Sampling: Simple randomization, | Design: RCT Setting: Community Data collection method: (PSS) and the UCLA loneliness scale (UCLA-LS) Data analysis: repeated measure covariance analysis, intergroup analysis | The CTFA-GRT significantly decreased the perceived stress and loneliness of rural older adults living alone in China. | Strengths Randomization done, quality control measures explained. Sample size justified using formula of beta power 0.80 Limitations: time duration not clear Quality Rating Medium |

**Table 1** (*continued*)

| Author/Year/Country | Purpose | Sample/ study duration | Method | Major Findings | Critical Appraisal |
|---|---|---|---|---|---|
| Sjjasop,2013, Freiburg/ Germon | To assess the effectiveness of developed a local, collaborative, stepped, and personalized care management approach (LoChro-Care) on chronic illness | Study duration: not mentioned Sample: I = 263,C = 261, male (n = 95) and female (n = 168) Age: Mean 65.6 ± 7.9 years Community based Sampling: Randomization(block method) Study duration: 18 months | Design: RCT Theoretical framework: Not provided Setting: Community Data collection method: GDS, Data analysis: Linear mixed modelling(LMM), Means differences | Supporting patients' self-management in coordinating their individual care network through LoChro-Care did not result in any significant effect on the primary and secondary outcomes. | Strengths Appropriate study design, reasonable sample size, Sample size calculation appropriate. Protocol registered Limitations: only for Freiburg population, exclusion criteria not clear Quality Rating Medium |
| Angelia Siaet al,2020, Singapore | To investigated the effects of a 24-session therapeutic horticulture program for wellbeing in older adults | Sample: T = 47, Female = 47 Age: 77.5 years (SD = 7.8. Participants = community based Sampling: Not mentioned Duration: 24 weeks, 2seesion/week | Design: Experimental pre and post intervention Theoretical framework: Not provided Setting: community Data collection method: Zung Self-Rating Depression Scale (SDS), (ADL), we used the Barthel Index (BI), five-item Friendship Scale (FS),EQ-5D-3L visual analogue scale (EQ VAS) Data analysis: ANOVA repeated measures Paired simple T. test. | Therapeutic horticulture program provides new evidence using a comprehensive set of indicators across the affective, cognitive, functional, psychosocial and physical domains | Strengths Well-structured program, clear time framework, used validated tools to measure outcome, Limitations Limitations Control group missing, Methodology not explicitly described. |
| Piyanee Klainin-Yobas, 2019 Singapore | "To describe experiences and perceptions of cardiac rehabilitation among a sample of women from South Asian communities" (p. 298) | Sample: I = 27,C = 28 Age: >60 Years Participants = community based Sampling: Randomized Duration: 12 weeks, 40mnt/2seesion/week for health education group, 40 mints one/week for 12 weeks mindfulness awareness program (MAP) | Design: two parallel groups RCT. Theoretical framework: Not provided Setting: community research center Data collection method: Data analysis: ANNOVA, Independent T. test 1. 20-item Geriatric Anxiety Inventory (GAI) 2. GDS-15, 3. Mini-Mental State Examination (MMSE) | HEP as a low cost effective intervention for promoting active aging and psychological health in a community setting. Can be applied for larger population | Strengths Objectivity maintained, single masking, Sample randomly assigned to group, Limitations Limitations Drop out were not eliminated From the final analysis Quality Rating Medium |
| froditi Stathi, 2022. | To establish whether a community-based active ageing intervention could prevent decline in lower limb physical functioning in older adults already at increased risk of mobility limitation. | Sample: I = 294,C = 334, Mean > 65 years Age: >60 years I = F = 241,M = 126 C = F = 273,M = 137 Participants: community dwellers Setting: community center Sampling: Block algorithm randomization | Design: Qualitative Descriptive Theoretical framework: No framework was provided Setting: Participants' home Data collection method: (36-item short-form survey [SF-36] and Euroquol 5-dimension questionnaire [EQ-5D]); and (13) a one-item loneliness scale Data analysis: Mix linear regression model | The REACT intervention showed that a 12-month physical activity and behavioural maintenance programme could help prevent decline in physical function over a 24-month period. | Strengths Blinding performed, Sample randomly allocated, Group maintenance performed. Gender distribution adequate Limitations Limitations High dropout rate in the final follow-up Quality Rating high |
| Lattore et al,2015 (Spain) | To evaluate the effectiveness of life review (LR) based on specific positive events to improve wellbeing in older adults | Total = 55 I = 26,C = 26, Mean > 65 years Age: I = 68.4.3 (7.01), C = 65.54 (5.95) Sample I = F = 72,M = 38 C = F = 73,M = 27 Participants: community dwellers Setting: community center Sampling: Block algorithm randomization | Design: Two arm RCT Theoretical framework: No framework was provided Setting: community based Duration: 8 weeks, 6 sessions on autobiographical journaling techniques. Data collection method: (CES-D Scale), Life Satisfaction Index(LSI), Written Autobiographical Memory Test (AMT) Data analysis: ANNOVA, Independent T test | Life Review could be a useful tool in enhancing emotional well-being in active aging programs, thus reducing depressive symptoms, and improving quality of life. | Strengths Two arm RCT, sample randomization Blinding performed, trail is registered. Limitations Limitations CONSORT flow chart is missing, Attrition rate not mentioned Quality Rating High |
| Rentanen,2019 Finland | To examine the effect of individualized, To assess the effect of theory-based | Total = 204 Age: 76(4.5) Sample | Design: Two arm RCT Setting: community center Duration: 12 months, 40 min | Individualize counselling can be helpful to improve quality of life in | Strengths RCT, simple randomization for |

**Table 1** (*continued*)

| Author/Year/ Country | Purpose | Sample/ study duration | Method | Major Findings | Critical Appraisal |
|---|---|---|---|---|---|
| | counselling intervention on active aging and quality of life among older people (the AGNES intervention study) HAPPY AGE | I = 101,C = 103), I = F = 72,M = 38 C = F = 73,M = 27 Age: > 60 years Participants: community dwellers Sampling: Block algorithm randomization | session 2/week, four phone counselling Data collection method:(OPQOL-brief) , Jyväskylä Active Aging Scale (UJACAS), Data Analysis: GEE models test, Generalized estimation equations | old age people living in the community and are high risk to develop disabilities. | sample allocation, Blinding performed, Limitations Limitations One satisfaction scale was mentioned but the results not mentioned. The therapist qualification not clear Quality Rating Medium |
| Chi, Ying-Chen,2021, China | To investigate the efficacy of a multi-disciplinary intervention program in community-based elderly | Total:195, I = 100,C = 95 I,F = 73,M = 22,C = F = 64,M = 36, Participants: Community based older adults Setting: community center Sampling: Simple randomization, G. power tool was used. Program: Community Aged Well-being Class (CAWC). Duration; 19 weeks | Design: Two arm RCT Setting: community center Duration: 19 weeks, 600 min total, 16 sessions 2/week Data collection method: Active Aging Scale, depression scale, healthy life scale, self-stream scale. Data Analysis: chi-squared tests, GEE model, factor analysis. | A multi-disciplinary intervention program in improving the cognition of healthy life, mental health status, social participation activities, and active aging | Strengths RCT, simple randomization for sample allocation, Involved trained Therapists, Conceptual framework developed. Limitations Limitations One satisfaction scale was mentioned but the results not mentioned. The therapist qualification not clear Quality Rating Medium |

discussed the benefits and drawbacks of the study. On the other hand, Some of the studies revealed, lacked a coherent theoretical framework and failed to reach consensus over the study questions, objectives, and hypotheses.

## 3. Result

Selection of the study: Initially, we found a total of 2636 articles from different databases. All the retrieved articles were filtered for duplication, were out of scope, and were not relevant to our research question. After removing 62 duplicate studies, 311 studies underwent title/abstract screening, during which 139 studies were removed because they did not focus on active aging and active aging promotion strategies or because they were more concerned with critical cases, frailty, and specific disease management (e.g., dementia, stroke, etc.). As a result, 172 studies in total were fully retrieved and evaluated independently by two reviewers (RB and SA) to determine their eligibility; 174 studies were excluded as they did not report an intervention for wellbeing in older adults (Escolar Chua & de Guzman, 2014; Ghodsbin et al., n.d.; Kapan et al., 2017; Klainin-Yobas et al., 2019; Latorre et al., 2015; Li et al., 2022; Rantanen, 2020; Sajjasopho, 2013; Sia et al., 2020; Stathi et al., 2019; Chi and Chen-Long, 2021) were reviewed for in-depth evaluation by considering the three main constructs of wellbeing such as life satisfaction, depression, subjective wellbeing, and quality of life.

Quality control: According to the CASP 10 scores Checklist for systematic review studies, all studies were not mentioned the quality control strategies in their experimental and interventional study designs. The interaction between the researchers and the participants were not adequately described in five investigations(Ghodsbin et al., n.d; Latorre et al., 2015; Sajjasopho, 2013; Sia et al., 2020; Chi and Chen-Long, 2021). The sample size calculation methods were not clearly mentioned in 2 studies(Li et al., 2022; Chi and Chen-Long, 2021).

### 3.1. Data syntheses

Data on study design, sample size and characteristics, types of active

aging programms, comparison groups, and outcomes were extracted from the selected studies and analysed using a coding scheme. For research quality assessment of quantitative research, the Effective Public Health Practise Project (EPHPP) tool (Thomas and Ciliska, 2004) was used to check because of its suitability for assessing such research with various study designs. The EPHPP tool evaluates eight components of a quantitative study: study design, selection bias, confounders, blinding, the data collection process, withdrawals or dropouts, interventional protocols, and selection bias. Based on performance in each component, an overall rating (i.e., strong, moderate, or weak) of each study can be determined with scores 1–3. For publications reporting more than one study, each study was independently analysed. Data coding and quality appraisal were conducted by the first author and a research assistant. Any inconsistencies between the reviewers were discussed between the two authors to achieve agreement.

### 3.2. Study characteristics

All projects were published between 2013 and 2022. The 12 studies were conducted in nine countries (Germany, Austria, Spain, China, Philippines, Finland, Singapore, Iran, and Thailand). All the studies were having control groups except one (Sia et al., 2020). See the description of the studies in (Table.1).Most research used leisure-based physical activities (Thomas and Ciliska, 2004; Stathi et al., 2019). Few followed behavioural change therapy such as counseling, coping strategies, and autobiographies and the majority of them used group interventions with an average of 45 min in each session, an average of three times in a week, some used face to face followed to home-based training programs using booklets, messages, telephone call and video guided home-based exercises. The setting were community-based older adults residence and independent living communities (n = 11), daycare centers (n = 1). The intervention was implemented in community centers, selected residential settings, and schools and colleges (Ghodsbin et al., n.d.; Klainin-Yobas et al., 2019; Chi and Chen-Long, 2021). The integrated intervention included exercises, mindfulness, and group-based activities for overall being in the majority of the studies but 2

studies aimed to only improve physical activity, and lower limb strengths through structures multidimensional exercises (Kapan et al., 2017; Stathi et al., 2019).

### 3.3. Measuring tools

Six studies examined functional independent ability indexes such as Time Up and Go (TUG), SPPB, WHOQOL-BREF, WHOQOL-OLD, the Well-being Scale, and the Life Satisfaction Scale. International Physical Activity Questionnaire (IPAQ), geriatric depression scale, and Health-related Quality of Life (HRQoL) scale to assess internal satisfaction and WB levels in older adults. The average time was 45 to 60 min, 2–3 times per week, for 8 weeks to 12 months. It is significant to note that this list of measuring instruments is not exhaustive, and researchers may use other tools depending on the precise emphasis and goals of their research. Additionally, cultural and contextual adjustments could be required to guarantee the applicability and relevance of these tools across a range of communities and contexts.

### 3.4. Intervention

All the studies followed subjective well-being by measuring life satisfaction, health-related quality of life, physical well-being, negative and positive emotions, and depression level in old age (Ghodsbin et al., n.d.; Kapan et al., 2017; Klainin-Yobas et al., 2019; Latorre et al., 2015), mostly followed the theoretical construct of the successful aging model developed by Rowe and Kahn's (Stowe & Cooney, 2015). Three studies only addressed the behavioural health to improve emotional wellbeing (Escolar Chua & de Guzman, 2014; Rantanen, 2020). Of the nine studies, there were five had determinants that covered more than a single domain, meaning the determinant could not be solely classified into one domain (Li et al., 2022; Sia et al., 2020; Chi and Chen-Long, 2021). Of the 12 studies, seven studies included determinants to improve physical health domain (Mittaz Hager et al., 2019; Oh et al., 2017, 2017; Rantanen, 2020; Gregory et al., 2012). These scientific studies insisted to maintain a high level of physical and mental health to maintain overall well-being and quality of life in community residence older adults.

### 3.5. Risk of bias

Two independent reviewers using ROB spread sheet and VOS-wiener available online. Result of bias in selected studies which include allocation, blinding, incomplete outcome, selective reporting, and other bias displayed in Fig. 3 and Fig. 4.

### 3.6. Effects of intervention

Quality of life

Five studies assessed the effects of community-based physical, and behavioral interventions using WHOQOL-BREF, WHOQOL-OLD FACT, and health-related quality-of-life tools. These studies show significant improvements in old age people having activity compromised, and spending sedentary life (Klainin-Yobas et al., 2019; Latorre et al., 2015). In four studies, Two study (Klainin-Yobas et al., 2019; Yodmai et al., 2021) had two intervention arms: social support, and health education, and the remaining followed the usual activities.

In the two group comparisons, the results of first group showed behavioral, and physical activity-based interventions and higher overall quality of life were reported,(p < 0.002). The behavioral group was more than the self-care management group or the usual care group. There was significant between-group variation. Overall quality of life score (p < 0.002). In the second group large effect size standardized mean difference (SMD = 1.082563), The mean and SD of physical and behavioral intervention were higher 98.30(1.39) than SMG 85.34 (1.36) and Usual Care 81.64 (0.97). Five Statistically significant improvements in physical functional ability, social engagement, sleep quality, and happiness were high as compared to the control group. This study brings statistical significance to QoL improvement at six weeks to 12 months (Stathi et al., 2019; Yodmai et al., 2021); In 19 weeks, 24 weeks (Sajjasopho, 2013);One year after the intervention(Sia et al., 2020). Interventions that provided combined face-to-face and home-based had low mean values (<0.004)compared to the intervention provided only classroom-based. Improvement in the intervention groups compared to the standard care group was statistically significant that favored QoL BREF status (F.6,368 = 2.17; p.0.04), QOL-OLD (F6,385 = 3.61; p. < 0.01) and HRQOL (F 6,365 = 2.34; p.0.04). There was a significant improvement in QoL from T1 to T2, and T3 ( β = 4.16,SE = 1.23p. 0.03. The intervention reduced psychological distress and increased the QoL score. The effect sizes were 0.6, 0.7, and 0.8, respectively. It has been revealed that depression and social isolation directly affect QoL in old age (Beridze et al., 2020; Sivertsen et al., 2015).

### 3.7. Effect on depression

Of the three studies evaluating the effects of physical and behavioral intervention on depression level, all of the studies shown a reduction in negative emotions, and depression after the intervention. The effect size is 0.42 and 0.15 points respectively (Rantanen, 2020); The average score was reduced by 4 points in GDS-15(ES = 2.19) at the end of treatment and follow-up period (Rantanen, 2020). Two other studies were also
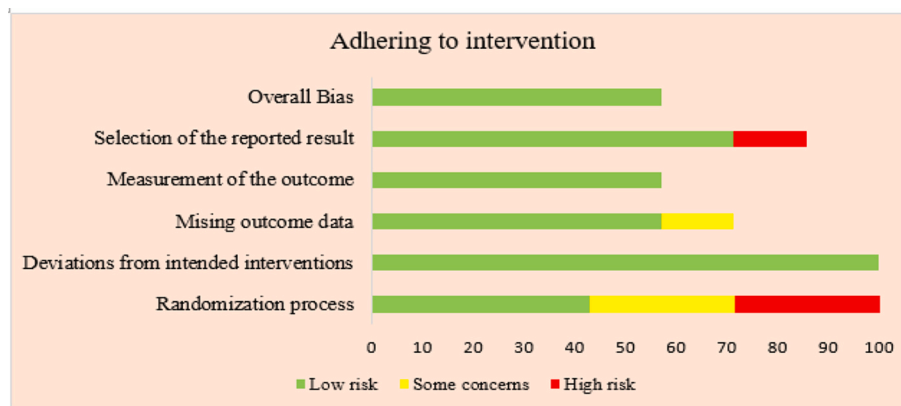


**Fig. 3.** Risk of bias graph: review authors' judgments about each risk of bias item. Presented as percentages across all included studies. Note: In the Figure three the green color indicates low risk of bias, yellow indicates moderate risk and red color shows high risk of bias in the studies. Overall, there were low risk of biases in all components except randomization process in most of the studies it was compromised. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)
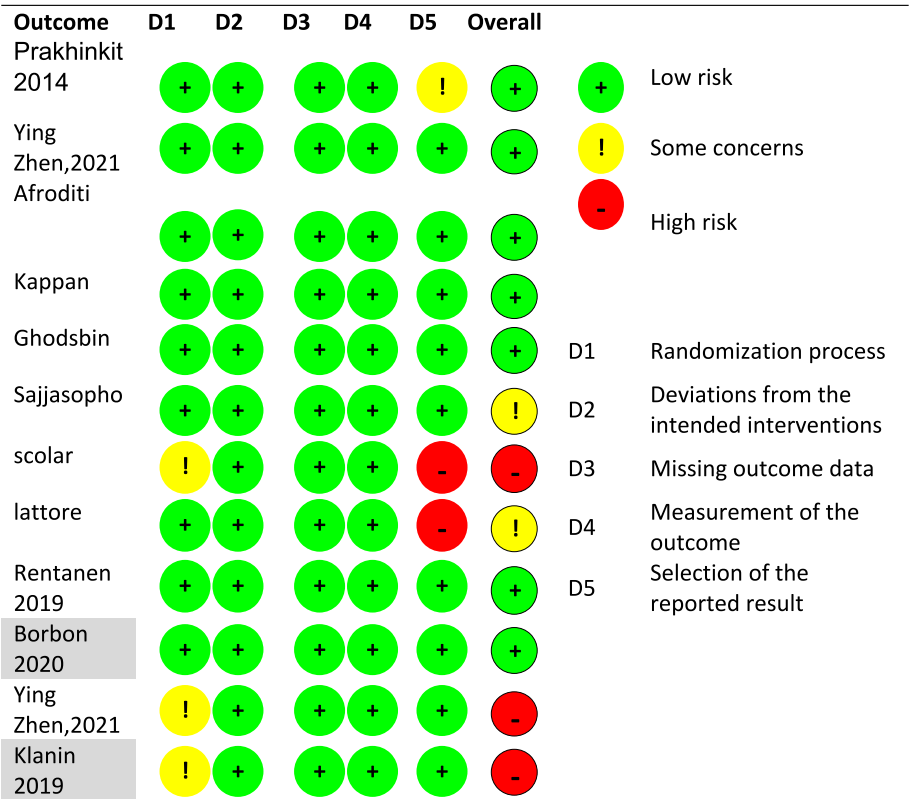
| Outcome | D1 | D2 | D3 | D4 | D5 | Overall |
|---|---|---|---|---|---|---|
| Prakhinkit 2014 | + | + | + | + | ! | + |
| Ying Zhen,2021 | + | + | + | + | + | + |
| Afroditi | + | + | + | + | + | + |
| Kappan | + | + | + | + | + | + |
| Ghodsbin | + | + | + | + | + | + |
| Sajjasopho | + | + | + | + | + | ! |
| scolar | ! | + | + | + | - | - |
| lattore | + | + | + | + | - | ! |
| Rentanen 2019 | + | + | + | + | + | + |
| Borbon 2020 | + | + | + | + | + | + |
| Ying Zhen,2021 | ! | + | + | + | + | - |
| Klanin 2019 | ! | + | + | + | + | - |

Legend:
- + Low risk
- ! Some concerns
- - High risk

- D1 Randomization process
- D2 Deviations from the intended interventions
- D3 Missing outcome data
- D4 Measurement of the outcome
- D5 Selection of the reported result

**Fig. 4.** Risk of bias level Assessment: Percentage wise authors' judgments about each item included in all studies. Note; Fig. 4 illustrated the biasness of the selected studies in which more plot with green indicated low biasness in majority of the studies. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

reported depression decreased after intervention ($\beta = 1.22$ SE $= 0.27, p. < 0.001$).

### 3.8. Effects on life satisfaction

In this review, four studies mentioned the effectiveness of the intervention in improving life satisfaction levels by the end of the therapy (Stathi et al., 2019). A significant group-by-time interaction has been observed at T3 ($\beta = 0.04$ SE $= 0.31 p. 0.780$). There were statistically significant differences observed between the intervention group and the control group in the post-test (t $= 2.25$; df $= 62$; $p < 0.05$) (Sia et al., 2020). In general, among 12 studies included in this review, four studies had revealed that the physical, and behavioral therapy both had significantly improved the overall well-being scale in older adults living in the community.

### 3.9. Overall effect size of study variables

The analysis involved examining the standardized mean difference as the outcome measure using a random-effects model with 12 studies. Heterogeneity in the results was detected, as indicated by a significant Q-test ($p. < 0.0001$), with an estimated tau$^2$ of 0.6197and I$^2$ of 94.4 %); Chi$^2$=337.7512' DF $= 8$. This suggests substantial variability in effect sizes across studies. The average standardized mean difference across studies was estimated at $-0.0274$ (95 % CI: $-0.6697$ to 0.8950 as statistically significant (Z $= 0.03752, p..0.02075$). However, the prediction interval ($-1.4820$ to 1.4273) indicated that the true outcomes could vary widely in individual studies, potentially including positive effects despite the average being negative. One study (Ying Chen, 2021) was identified as a potential outlier, and another study was deemed influential. While the average effect seemed significant. However, the presence of heterogeneity suggests that the impact of the intervention may

vary across studies.

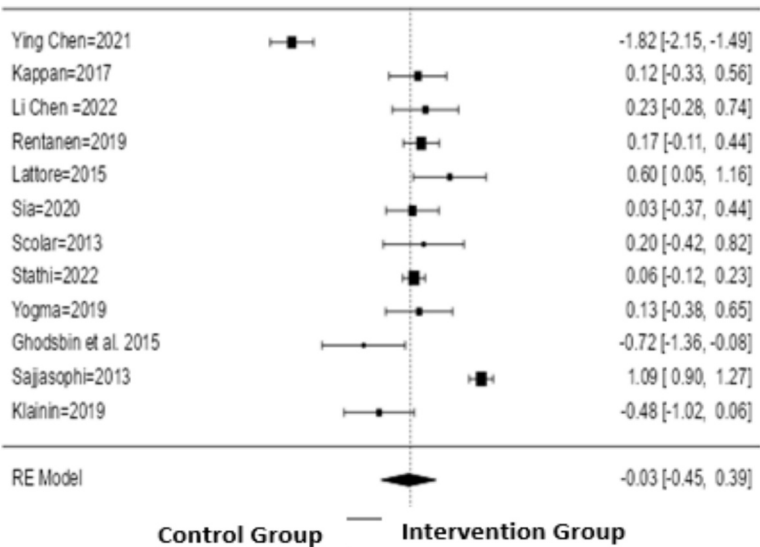### 3.10. Effect size on overall subjective wellbeing(SWB)

The wellbeing in older adults was medium 0.35 (0.12, 0.66) with high heterogeneity among studies ($p. < 0.00001$, I$^2 = 92$ %). (Fig. 5) The effect size ranged between 0.02(Li et al., 2022) and 1.35(Sia et al., 2020). The large ES $= 1.17$ and 1.54 were reported by(Sajjasopho, 2013; Yodmai et al., 2021), respectively. Four studies reported medium ES ranging from 0.28 (Latorre et al., 2015)to (0.62) (Klainin-Yobas et al., 2019), remaining studies reported small ES ranging from 0 to 0.18. Regarding subgroup analysis, a significant difference was observed on the type of intervention provider ($p.0.04$). The intervention provided by peer volunteer, and lay leader support had a medium effect size (ES $= 0.66$, $p. 0.002$) (see Table 2).No significant difference was observed among studies on the method of intervention ($p.0.26$), duration of intervention($p. < 0.36$), control group ($p. 0.14$), and mode of intervention ($p.0.22$).

### 3.11. Subgroup analysis for intervention effect on depression

A random-effects model applied to account for potential variability in the data. To assess heterogeneity between studies, a Limit Maximum Likelihood Estimator (tau$^2$) was employed. tau$^2 > 0$) is determined, the prediction interval is calculated to provide a measure of the true result. Examination of outliers and impactful studies was performed using standardized residuals and Cook distances. The identification of outliers follows a Bonfloni corrected threshold ($\alpha = 0.05$), and if the Cook distance exceeds six times the median plus interquartile range, the study is considered influential. Funnel graph asymmetry is assessed using rank correlation and regression tests. Three studies were included in the analysis. It is worth noting that the observed SMD values are mainly

| Ying Chen=2021 | 100 | 4.2 | 3.8 | 95 | 10.63 | 3.2 |
| Kappan=2017 | 41 | 20.2 | 14 | 38 | 18.62 | 13 |
| Li Chen =2022 | 30 | 57.63 | 52 | 30 | 46.2 | 45 |
| Rentanen=2019 | 101 | 21.42 | 11 | 103 | 19.31 | 14 |
| Lattore=2015 | 26 | 19.8 | 2.6 | 26 | 17.2 | 5.4 |
| Sia=2020 | 47 | 75.92 | 55 | 46 | 74.08 | 57 |
| Scolar=2013 | 20 | 23.4 | 5.9 | 20 | 22.1 | 6.6 |
| Stathi=2022 | 294 | 24.91 | 17 | 234 | 23.92 | 19 |
| Yogma=2019 | 55 | 85.62 | 67 | 20 | 76.13 | 77 |
| Ghodsbin et al. 2015 | 20 | 4.2 | 2.8 | 20 | 5.98 | 2 |
| Sajjasophi=2013 | 263 | 35.72 | 2.23 | 261 | 28.44 | 9.2 |
| Klainin=2019 | 27 | 6.3 | 4 | 28 | 8.2 | 3.8 |

**Table. Mean and standard deviation of 12 studies**

Forest plot values:
- Ying Chen=2021: -1.82 [-2.15, -1.49]
- Kappan=2017: 0.12 [-0.33, 0.56]
- Li Chen =2022: 0.23 [-0.28, 0.74]
- Rentanen=2019: 0.17 [-0.11, 0.44]
- Lattore=2015: 0.60 [0.05, 1.16]
- Sia=2020: 0.03 [-0.37, 0.44]
- Scolar=2013: 0.20 [-0.42, 0.82]
- Stathi=2022: 0.06 [-0.12, 0.23]
- Yogma=2019: 0.13 [-0.38, 0.65]
- Ghodsbin et al. 2015: -0.72 [-1.36, -0.08]
- Sajjasophi=2013: 1.09 [0.90, 1.27]
- Klainin=2019: -0.48 [-1.02, 0.06]
- RE Model: -0.03 [-0.45, 0.39]

**Control Group — Intervention Group**

Random-Effects Model (k = 12) Total (95% CI); Heterogeneity: $Tau^2 = 0.6197$, $I^2 = 95.2381\%$). $Chi^{2=}337.7512$ DF =8.0, $I^2=$ 95% Test of overall effect's (z = 0.03752, p = 0.02075).

**Fig. 5.** Forest plot of random effects model of physical, and behavioral therapy on overall outcome variables. **Note:** The table and forest plot comparing the mean and standard deviation across control and intervention groups. There is no significant overall effect of the intervention across all studies combined ($z = 0.03752$, $p = 0.02075$). The overall confidence interval crosses zero ([-0.03] to (0.45)], indicating that the intervention may not have a consistent effect across all studies.

negative (100 %). The mean SMD estimate from the random-effects model was $\hat{\mu}$ = -0.3300 (95 % CI: −0.5618 to.0982), indicating a significant deviation from zero (z = -2.7899, $p.0.0053$). The Q test showed no significant heterogeneity (Q (2) = 0.0872, $p.0.95$, /b148 > $tau^2$ = 0.0000, $I^2$ = 0.0000 %), indicating consistency between true results. In addition, no outliers were detected and all residuals were within the means of (2.3940 ± 1.0).Similarly, no studies have shown the excessive effect indicated by the Cook distance. Use rank correlation ($p..0.33$) and regression test ($p.$ 0.04743). Funnel chart showed symmetrical SMD (see Forest plot in Fig. 6).

### 3.12. Effect size on life satisfaction

Four studies evaluated the effect of physical, and behavioral intervention on older adults' life satisfaction were included with observed standardized mean differences ranging from 0.3066 to 1.2790, mainly reflecting positive estimates (100 %). The standardized mean difference estimate from the random-effects model was estimated(0.8552 (95 % CI: 0.4717 to 1.2387). This finding indicates a significant deviation from zero (z = 4.3710, $p < 0.0001$), indicating a meaningful impact. The Q test showed significant heterogeneity between true outcomes (Q (3) = 10.0968, p. 0.0178, $tau^2$ = 0.1072,$I^2$ = 73.6464 %. Despite this heterogeneity, the estimated mean outcome direction was broadly consistent with the true outcomes studied. The predicted interval (95 % confidence) for true outcomes ranged from (0.1077 to 1.6027). In the residuals of studentization, one study (Sia = 47, 46) showed values above ±2.4977, indicating potential outliers in the model. However, Cook's distance does not indicate any overly impactful research. Neither the rank correlation test nor the regression test showed significant asymmetry of the funnel graph ($p.0.7500$ and $p.0.7710$, respectively), confirming the reliability of the analysis results. (see Fig. 7).

### 3.13. Quality of life

Five studies were included with observed standardized mean differences ranging from 0.3066 to 1.2790, mainly reflecting positive

estimates (100 %). The mean standardized mean difference estimate from the random-effects model was = 0.8552 (95 % CI: 0.4717 to 1.2387). This finding indicates a significant deviation from zero (z = 4.3710, $p < 0.0001$), indicating a meaningful impact. The Q test showed significant heterogeneity between true outcomes (Q(3) = 10.0968, $p.0.0178$, $tau^2$ = 0.1072, $I^2$ = 73.6464 %. Despite this heterogeneity, the estimated mean outcome direction was broadly consistent with the true outcomes studied. The predicted interval (95 % confidence) for true outcomes ranged from 0.1077 to 1.6027. When examining the residuals of studentization, one study (Sia = 47, 46) showed values above ± 2.4977, indicating potential outliers in the model. However, Cook's distance does not indicate any overly impactful research. Neither the rank correlation test nor the regression test showed significant asymmetry of the funnel graph ($p.0.7500$ and $p.$ 0.7710, respectively), confirming the reliability of the analysis results. (see Fig. 8).

## 4. Discussion

The purpose of this systematic review was to evaluate the effectiveness of physical, and behavioral intervention approach on the subjective WB of community based older adults(Arshad et al., 2016). The investigation revealed significant positive effects of physical, and behavioral focused intervention on enhancing overall WB, supported by the majority of the included studies (Bartholomaeus and Agteren, 2019). Additionally, the intervention demonstrated favorable outcomes in terms of reducing depression, improving self-steam, life satisfaction, and quality of life in older adults who live in community. The level of WB used well established scales, such as Subjective WB scale, life satisfaction scale, QHOQOL-BREF, WHOQOL,OLD, geriatrics depression scale (GDS-15), which included specific modules related to older adults living in the community with poor quality of life. Remarkably, the all-basic instruments revealed comparable domains, allowing for a comprehensive assessment in physical, emotional, behavioral, and internal happiness aspect (Franzke et al., 2018).

The collective effect size of physical, and behavioral intervention on the subjective WB of community based older adults demonstrated a

**Table 2**
Methodological characteristics, and Effect size of the in subgroup analysis.

| Subgroup analysis | Studies | Effects size(ES = 95 % CI) | Heterogeneity test = I2 |
|---|---|---|---|
| Mood of intervention | | | |
| face to face | 3 | 0.25 [−0.04, 0.53] 81 % | 82 % |
| Telephone | 5 | 0.25 [−0.11, 0.61] | 75 % |
| lay leaders | 2 | 1.30 [0.06, 2.53] | 88 % |
| Face to face, video based and telephoning intervention | 2 | 0.28 [−0.14, 0.68] | 78 % |
| Duration of intervention | | | |
| Less than 6 weeks | 1 | 0.26 [0.05, 0.60] | |
| 6–12 weeks | 6 | 1.74 [0.08, 1.38] | 92 % |
| Greater than 12 weeks | 5 | 0.33 [−0.06, 0.57] | 70 % |
| Control group | | | |
| Usual care | 9 | 0.72 [0.08, 1.36] | 92 % |
| Wait list | | | |
| Alternative intervention | 3 | 0.10 [−0.11, 0.30] | 0 % |
| Type of intervention provider | | | |
| Nurse | 3 | 1.15 [−0.46, 2.62] | 88 % |
| Psychiatrist, psychologist, physiotherapist | 2 | 0.10 [−0.12, 0.33] | 10 % |
| Peer volunteer, social support, professional therapist | 2 | 0.08 [−0.10, 0.25] | 0 % |
| both trained therapist and volunteers | 5 | 0.66 [0.25, 1.06] | 75 % |

**Note:** The table presents a subgroup analysis from a study, showing the effect sizes (ES) with 95 % confidence intervals (CI) across different methodological characteristics. Interventions delivered by lay leaders, and nurses showed the largest and potentially most significant effects. Heterogeneity varies across subgroups, which suggests some variability in the results across studies within each subgroup.
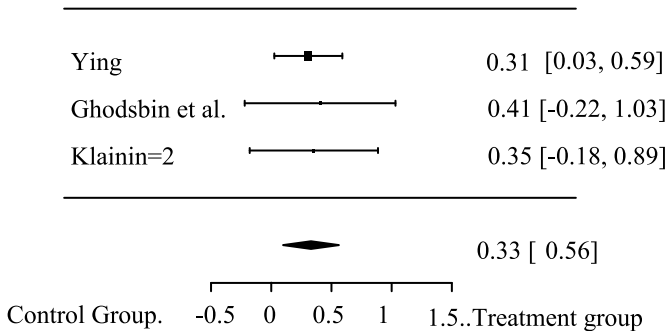


**Fig. 6.** Forest plot of random effects model *meta*-analysis of the effect of physical, and behavioral therapy on depression. Fig. 6 shows that Tau$^2$ = 1.4352, (SE = 2.0557, Chi2 = 1.000, DF = 2(p.0.95);12 = 0.000, test if overall effect: Z = 2. 79;(p. < 0.005). The overall pooled effect size of 0.33 with a 95 % CI that does not cross zero suggests a statistically significant positive effect of the treatment. Fig. 7. Forest plot of random effects model *meta*-analysis of the effect of physical, and behavioral therapy on life satisfaction of community based older adults.

medium scale, similar to the results of a *meta*-analysis on psychosocial, and psychosocial interventions for older adults with negative affect. This alignment indicates the potential benefits of both physical, and behavioral interventions in having a positive impact on different aspects of

older adults WB. Specifically, it has been noticed that a significant improvement observed in the health related quality of life scale, life satisfaction, subjective WB scale, and depression scale(p. < 0.005) (Escolar Chua & de Guzman, 2014). These findings are consistent with previous studies, in which physical activity and behavioral therapy with counselling, and life review therapy improve subjective WB in older adults risk mental health illness (Gonot-Schoupinsky & Garip, 2018; Latorre et al., 2015; Rantanen, 2020). Subgroup analysis revealed significant distinctions regarding intervention providers, where physical, and behavioral intervention was administered by professional therapist, and lay leader (volunteers support). This relationship between provider expertise and treatment effectiveness reinforces the importance of skilled delivery in achieving optimal outcomes with the support of social volunteers and lay leaders. The results of the study are consistent with previous research indicating the effectiveness of psychosocial interventions on the overall WB of community based older adults. This synergy can be attributed to the shared emphasis on both physical, and psychological interventions in various studies (Kapan et al., 2017; King et al., 2013). However, it is important to recognize the context of this review as specific to older adults who live in the community, which requires careful comparison with other older adults reside in long-term care homes and old age houses (Akber et al., 2020). A *meta*-analysis study (Armitage & Conner, 2001), and systematic review of contemporary literature (Abud et al., 2022) and integrative review (Gonot-Schoupinsky & Garip, 2018) had shown the effectiveness of the psychosocial intervention augmented with physical activities such as dancing, laughing, chair game for psychological and emotional WB and QOL of life of socially detached, and inactive older adults. The similarity in the effectiveness of the intervention might be the similarity of the inclusion criteria.

Although some variations in depression scores were reported, but the broader picture emphasized a positive pathway, in which negative emotions were inversely associated with improvement in QOL. Socially isolated and poor physical activity, often associated with older adults, emerged as an important factor affecting over all WB. The presence of sedentary life, emotional upset, mal adoptive behaviors were found to be associated with higher prevalence of chronic diseases, and mental health problems in old age as compare to those who were socially and physically active, involve in pain and unpaid voluntarily activities(Chan et al., 2017; Stathi et al., 2019). Nonthless, the effects of physcial, and behavioral treatment onover all WB domonisterated cariability due to studies hetrogenecity. In contrast, a subset of studies find psychological interventions, and physical exercises to be effective in reducing negative affect in old age (P. < 0.002). The effects on depression demonstrated medium to large effect sizes, consistent with varying degrees of efficacy reported in relevant studies (Ghodsbin et al., n.d.; Rantanen, 2020). In particular, blended manner (online and offline interventions conducted by trained and layperson support intervention appear to be particularly effective, facilitating older adults social interaction, improve morale, efficacy and interpersonal support (Bartholomaeus and Agteren, 2019; Chi and Chen-Long, 2021). Discrepancies in effect sizes may stem from variations in study heterogeneity and outcome measurement tools (Escolar Chua & de Guzman, 2014).

In the review, one study two studies (Ghodsbin et al., n.d.; Rantanen, 2020) showed a strong relationship between lonliness intervention and depression, self steam and quality of life (QOL). After the intervention, the treatment group demonstrated a reduction in depressive level, and improved life satisfaction in older adults. Specifically, a significant relationship was observed between the severity of depression, lonliness and over all WB after 12 weeks treatment, suggesting that the presence or absence of social detachment may affect the WB of community dwelling older adults. Social isolation emerged as an important factor affecting the QOL of older adults. However, it is worth noting that the overall effects of lonliness intervention on WB shown a small statistical difference between the intervention and control groups. This can possibly be attributed to study heterogeneity (p. < 0.00001, I2 = 94.6

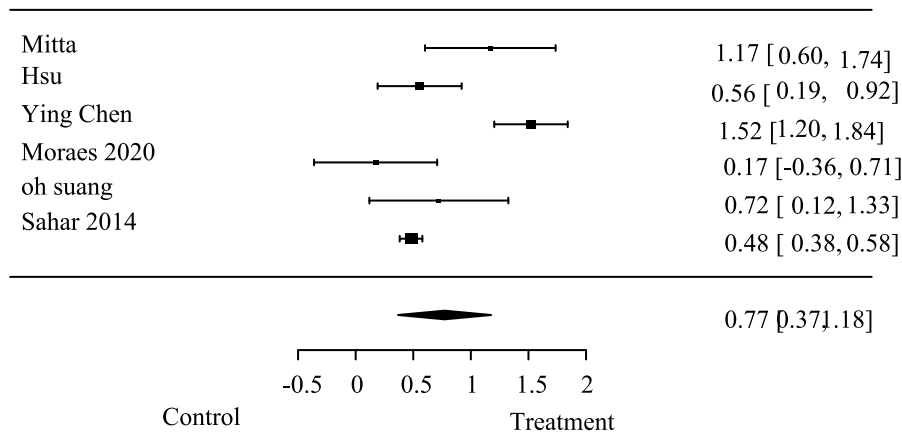**Fig. 7.** Heterogenicity Tau2 = 1.1072, (SE = 0.1252, Chi2 = 3.37, DF = 3(0.018), test of overall effect's = 4.37;(p. < 0.001). The black squares represent the point estimate of the effect (e.g., the mean difference and the horizontal lines with shorter length indicates the precision of the estimate in the confident interval (CI). Most of the studies point estimates are > 1.5 indicating a treatment effect favoring the treatment group.
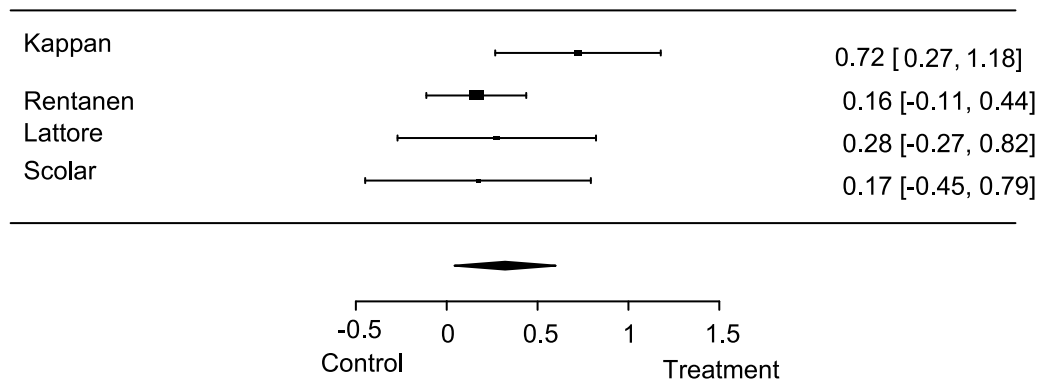


**Fig. 8.** Forest plot of random effects model *meta*-analysis of the effect of physical, and behavioral therapy on QOL of community based older adults. The overall pooled effect size of 0.28 is statistically significant (Z = 4.57, p < 0.001), indicating a positive treatment effect. Heterogeneity is moderate ($I^2$ = 35.97 %), with the variation between study results being non-significant (p.0.219).".

%), with only three studies included in the analysis, which likely affected the combined effect size.

In this review, one study (Klainin-Yobas et al., 2019) reported that psychological interventions did not improve life satisfaction. This can be attributed to the other factors responsibe for poor qality of life in older adults, which has led to more adherence to the intervention only provided for health managment. Furthermore, the multidimensional nature of the subjevtive WB scale may make it insensitive to detecting beneficial effects of interventions, making it less suitable for measuring the outcomes of WB.

In contrast, a different approach emerged from another study (Armitage & Conner, 2001) which reported much higher summary effect sizes of behavioral and physical combine intervention QoL (ES = −1.11 and −1.12, respectively). This discrepancy may arise from variations in study heterogeneity and outcome measurement tools. Of the six studies evaluating the effectiveness of the intervention in this review, five studies demonstrated positive effects on QOL(Escolar Chua & de Guzman, 2014; Kapan et al., 2017; Latorre et al., 2015; Rantanen, 2020; Stathi et al., 2019). In the line of this review, some systematic reviews and *meta*-analyses (Lampit et al., 2014; Buyl et al., 2020; Mittaz Hager et al., 2019; Yodmai et al., 2021) highlighted the effectiveness of interventions in imroving physical activity, involvment in fun based learning, adopting healthy life style reducing anxiety and depression, improve self steam, and WB possibly due to the similarity of physical and behavioral approach intervention that promotes physical fucntional fitness, social interaction and life review sharing, ultimately

contributing to improve overall sense of WB in high risk older adults for poor quality of life.

Furthermore, this study highlighted the importance of physical, and behavioral intervention for community based older adult's welbeing, potentially helping to adhere to practice healthy life style,and contribute to society. However, a study within this review (Klainin-Yobas et al., 2019) indicated that physical, and behavioral focused intervention shown a small effect on group-by-time interaction effect on the life satisfaction scale. The reason for this can be attributed to discrepancies in inclusion criteria that have not been properly resolved. Various physical activties and behavioral modification techniques were used in this review. Therefore, a conclusion about the effect of behavioral modification with counselling, mubility boosting with fun based physical activities can be adopted by considering contextual, and individual cherecteristics of older adults. The majority of the studies in this review had provided face to face and home based intervention.Congruently, physical, and behavioral intervention with counselling and fun based interventions could have been more effective if it had been utilized in the context of group and individual combined therapy. However, further studies should be conducted to identify whether combined face to face andhome based intervention is more effective for WB. Of the twelve randomized control trials studies included in this review, trained therapist participated in the provision of the intervention in four trials, lay leader, peer volunteer support and trained therapist improved WB, reduced depression more effectively (Li et al., 2022; Sia et al., 2020; Chi and Chen-Long, 2021; Yodmai et al., 2021). This might be due to the fact

that combination of profesionally trained therapist and supportive leaders enhace the learning synergy to change mal adoptive behaviour, and imroving self efficacy for healthy life style in old age.

**Study strength and limitation:** To our knowledge, this is the first systematic review and Meta-analysis used to assess the effectiveness of a combined approach of physical and behavioral intervention on the SWB of older adults. Priority Reporting Items for Managed Review and Meta-Analysis Guidelines (PRISMA) and Cochrane Collaboration Recommendations were followed. Study selection, data extraction, and the risk of estimating bias were done independently.

**Study limitations:** The inclusion of the review was limited to the English language. articles, which may limit non-English publications. The Key areas of diversity were found related intervention use; How to deliver the intervention; the duration of the intervention. Therefore, there should be a careful general interpretation of the results.

**Implications for Practice:** This review found evidence that physical activity and behavioral change interventions appear to be effective in improving subjective WB in older adults. Older adults can spend high quality of life and social participation after physical, and behavioral therapy. There was a strong correlation between depression and poor WB (Escolar Chua & de Guzman, 2014; Rantanen, 2020). This review study may help policymakers, public health workers to incorporate as a part of the practice of standard care to enhance WB in old age.

## 5. Conclusions

The result of this review and meta analysis suggested that physical activity and behavioral therapy together more effective for functional mobility, and overall well-being of older adults who are at risk for disabilities and other co-morbidities. However, this conclusion should be made cautiously because of the above-mentioned limitations. In future research, further randomized controlled trials with adequate randomization, allocation concealment, and appropriate blinding may be needed.

## Author contributions

RM,ZY had the idea of the study, performed literature search, and data synthesis. ZY,H.K, N.A and F;R performed data selection, and data extraction, H.K,RB, performed risk of bias assessment. N.B and MI performed the data synthesis and prepared manuscript, and critically revised the manuscript.

## CRediT authorship contribution statement

**Rashida Bibi:** Investigation, Formal analysis, Data curation, Conceptualization. **Zhang Yan:** Formal analysis, Conceptualization. **Hamayun Khan:** Investigation, Data curation. **Fath ur Rahman:** Software, Methodology. **Nahed Ahmed Hussien:** Validation, Formal analysis. **Imtiaz Alam:** Resources, Formal analysis, Data curation.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Data availability

All data generated or analyzed during this study are included in this published article and in the supplementary information files.

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