

THE IMPACT OF PRIMARY HEALTH CARE INTERVENTIONS ON ELDERLY QUALITY OF LIFE (QOL): A SYSTEMATIC REVIEW

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ABSTRACT

Population aging is a global phenomenon driven by declining fertility rates and increasing life expectancy, leading to challenges in healthcare systems worldwide. Primary health care (PHC) programs for the elderly are essential to improve this population's quality of life (QOL). This systematic review aimed to describe the global primary health care programs for the elderly and their impact on the QOL of the elderly. Four search engines, PubMed, Scopus, ScienceDirect, and Cochrane, were used, and published from 2013 to 2018 were included for review with quality assessment. Sixteen studies were analyzed, focusing on interventions targeting chronic diseases, mental health, frailty, pharmacotherapy, home care, physical activity, and nutrition. Disease management, including education, home care services, and injury prevention among the elderly, were the main types of interventions implemented. While some interventions showed positive impacts on QOL, others reported insignificant changes. Factors influencing effectiveness included participant characteristics, intervention design, and disease-specific considerations. Overall, successful intervention rates were moderate, emphasizing the importance of tailored, comprehensive programs in primary healthcare settings to address the needs of aging populations. Limitations include heterogeneity in measurement models and potential biases in study selection. Many studies showed the impact of change on the QOL of the elderly. Healthcare professionals and multi-disciplinary health team integration were the main elements of probability for successful programs. This review could give policymakers an opinion on initiating or improving the programs. Further research should explore disease-specific interventions and consider outcomes in secondary and tertiary care settings.

Key words: primary health care, elderly, quality of life, QOL, health intervention

INTRODUCTION

In most countries today, population aging is on an upward trend. This scenario is triggered by two main contributors: decreasing fertility rates and rising life expectancy. It was reported by the United Nations that the proportion of persons aged 60 years and above, compared to the total population, is expected to double between 2007 and 2050. It was also projected that the number of older persons aged 60 and above will be 1.4 billion, 2.1 billion, and 3.1 billion in the years 2030, 2050, and 2100, respectively (United Nations, 2017).

Looking at the current global burden of disease, non-communicable physical, sensory, and cognitive impairments are some of the main domains. At the same time, they are increasing the disability burden experienced by the elderly too, especially those from low- and middle-income settings (Hay et al., 2017). In other words, rapid population aging will increase the number of elderly people with impaired intrinsic capacity and long-term complex conditions, which will continue to create challenges for the health system. The classical concept of the health system, which aims to provide episodic and curative health care, and the current style of delivering health care services, will no longer meet the requirements of the near future population (Briggs & Dreinhöfer, 2017; De Carvalho et al., 2017).

Population aging presents significant challenges for healthcare systems globally, particularly in low- and middle-income countries where resources may be limited. As the elderly population grows, so does the burden of non-communicable diseases and age-related impairments, leading to increased demand for healthcare services tailored to the needs of older adults. The scenario would be different in comparing developed and developing countries, where developed countries are primarily ready regarding environmental facilities, social support, financial coverage, and others. As for developing countries such as Malaysia, it poses a challenge as the aging rate increases faster than the country's ability to provide required services. Malaysia is working hard to ensure the elderly have a better and healthier quality of life (QOL). Looking back at the achievements of the Tenth Malaysian Plan, the number of hospital beds in Malaysia increased from 55180 in 2010 to 58530 in 2014.

This improvement was made to meet not only the growing number of hospital admissions among the elderly but also the longer length of stay (Abd Manaf et al., 2017). Despite efforts to improve healthcare infrastructure and services for the elderly in countries like Malaysia, there remains a gap in understanding the effectiveness of interventions implemented in primary care settings. While hospital bed capacity has increased, there is a need to assess the impact of primary care interventions on the quality of life (QOL) of older adults, particularly in district and countryside areas where they often reside. Existing research may not adequately address the unique needs and challenges faced by elderly populations in these settings, leaving a gap in knowledge regarding the most effective approaches to enhance their QOL.

Moreover, while some studies may have evaluated specific interventions, there is a lack of comprehensive analysis synthesizing the findings across different interventions and settings. Understanding which interventions are most effective in improving QOL for elderly individuals in primary care settings can inform policy and practice decisions aimed at addressing the needs of aging populations in Malaysia and similar contexts. Thus, this review aims to bridge this gap by systematically examining the available literature on primary care interventions for the elderly and their impact on QOL, thereby providing valuable insights for policymakers, healthcare providers, and researchers working in this field.

METHOD

Search Protocol

This systematic review was based on the PRISMA statement, a tool to summarize accurate, reliable, quality evidence through transparent reporting (Moher et al., 2009). The search was performed on Scopus, Cochrane, Science Direct, and PubMed databases. The search strategy follows the PICO strategy. Key search terms included Population for "elderly" OR "aged people" OR "geriatric" OR "older adult" OR "old person" OR "old individual" OR "old population" OR "senior adult" and Intervention for "primary health care" OR "primary health" OR "district health" OR "primary health clinic" OR "district health clinic" and comparison for "program" OR "programs" OR "service" OR "services" OR "intervention" OR "interventions" and Outcome for "quality of life" OR "health status" OR "health profile*" OR HRQL OR HRQOL OR QOL. The search was restricted to studies conducted in the past five years, 2013 to 2018. The search was limited to English languages and was done on 24 September 2018. Unpublished literature was not searched.

Selection

Articles were reviewed in two stages by a pair of reviewers. In the first stage, a pair of reviewers independently screened part of the titles and abstracts for inclusion of all the potential studies that had been identified as a result of the search and coded them as 'Y' for eligible or potentially eligible/unclear studies or 'N' for the do not retrieve studies. In the second stage, the full-text study reports/publications were retrieved, and a pair of reviewers independently screened the full-text and identified studies for inclusion and recorded reasons for excluding the ineligible studies. The third author resolved any disagreement.

Data extraction

Data extraction was conducted for the accepted studies after review of the full article using a standardized form. These included type of article, study design, country involved, target population, sampling method, sample size, description of the type of primary health care programs/intervention/services provided for the elderly, impact of the primary care programs/interventions/services provided towards QOL of elderly and factors affecting implementation of the primary care programs for elderly.

Evaluation of quality of studies

The Downs and Black Scale was used to evaluate the studies' qualities in this systematic review. It consists of 27 questions relating to the quality of reporting (ten questions), external validity (three questions), internal validity (bias and confounding) (13 questions), and statistical power (one question). The score ranges were excellent (26-28), good (20-25), fair (15-19), and poor (< 14) (Downs & Black, 1998).

Two reviewers were assigned to each study and assessed it independently. Regarding the quality of reporting, most of the studies clearly described their aim and objectives. Yet, only five studies clearly explained the distributions of principal confounders in each group of subjects to be compared. Most of the studies also report their finding for external validity, internal validity, and statistical power.

Overall, the study was categorized as a good quality with 22 mean scores (Table II). Two studies were considered excellent studies with scores of 27 (Lewis et al., 2017; Suominen et al., 2015). Meanwhile, there was one study considered poor (Rossato et al., 2013).

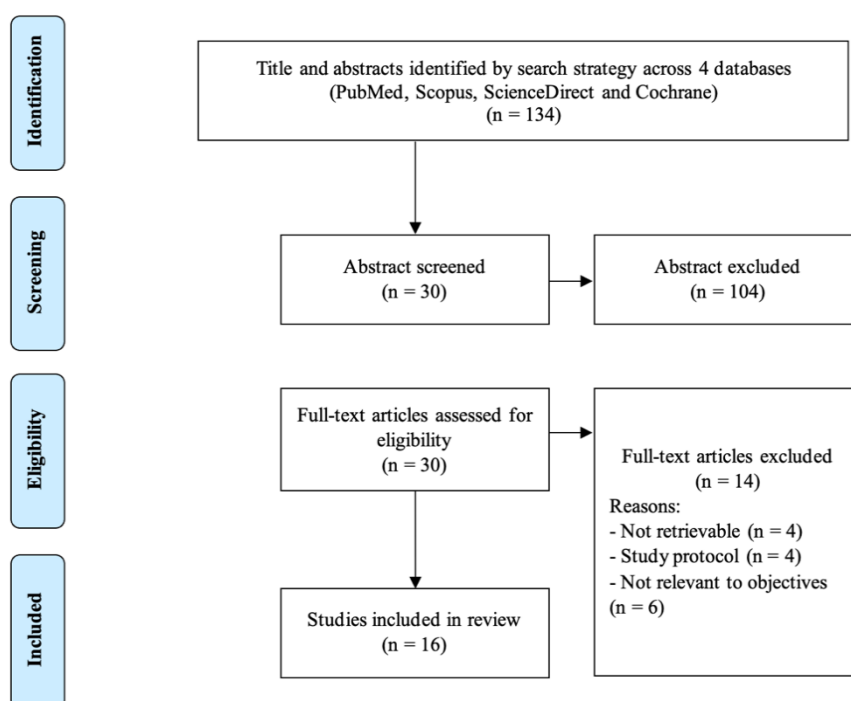
RESULTS

Literature search and study selection

The search strategy resulted in a total of 134 literatures. Following the removal of duplicate literature, 30 articles were retrieved to be assessed for eligibility and detailed evaluation. Further evaluation of the remaining titles and abstracts excluded another 13 studies. Four (4) full articles cannot be retrieved, four (4) were not original articles, and another six (6) were irrelevant to the objectives. Sixteen (16) remaining articles were included for analysis (Bosanquet et al., 2017; Wilson et al., 2017; Holtzer-Goor et al., 2015; Lewis et al., 2017; Willeboordse et al., 2017; Iliffe et al., 2014; Suominen et al., 2015; Røsstad et al., 2017; Bleijenberg et al., 2016; Yaman & Atay, 2018; Ruikes et al., 2016; Rossato et al., 2013; Kallio et al., 2018; Chao et al., 2015; Vaillant-Roussel et al., 2016; Hoogendijk et al., 2016). Figure 1 shows the flow diagram of the selection process according to PRISMA flow diagram (Moher et al., 2009).

Fig. 1 PRISMA flow diagram for this review

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Study characteristics

The characteristics of the included studies are listed in Table 1. Of the 16 selected studies, about 81% (n=13) were randomized controlled trials (RCT) which include either clustered, multi-centered two-arm or single-blinded RCT (Bosanquet et al., 2017; Lewis et al., 2017; Willeboordse et al., 2017; Iliffe et al., 2014; Suominen et al., 2015; Røsstad et al., 2017; Bleijenberg et al., 2016; Yaman & Atay, 2018; Ruikes et al., 2016; Kallio et al., 2018; Chao et al., 2015; Vaillant-Roussel et al., 2016; Hoogendijk et al., 2016). One used cohort design and two were cross-sectional study (Holtzer-Goor et al., 2015; Rossato et al., 2013). The RCT involved participants ranging from 99 to 3092; the cohort study had 50 247 participants, while the two cross-sectional studies had 511 and 58306 participants, respectively. Participants' targeted age was as low as fifty 10; however, most targeted elderly were 65 years and above. The studies included in this review came from four of seven continents – Europe (the Netherlands, United Kingdom, Finland, France, Norway, Sweden, Spain), Asia (China and Turkey), Oceania (New Zealand and Australia), and South America.

Elderly primary health care services

The health care services or interventions done targeted a diverse subject matter. Almost all developed interventions for chronic disease were targeting general chronic disease (Holtzer-Goor et al., 2015), psychiatry depression (Bosanquet et al., 2017; Lewis et al., 2017) and dementia (Chao et al., 2015), cardiovascular (Vaillant-Roussel et al., 2016) or diabetes (Chao et al., 2015). Some focused on fall and frailty issues where these studies aimed for prevention or functional preservation (Wilson et al., 2017; Røsstad et al., 2017; Ruikes et al., 2016; Hoogendijk et al., 2016) or pharmacotherapy looking at managing polypharmacy or advising on treatment plans (Willeboordse et al., 2017; Vaillant-Roussel et al., 2016). There was study looking at home visit or home care (Røsstad et al., 2017). A few looked at the effect of exercise or physical activity (Iliffe et al., 2014; Yaman & Atay, 2018; Ruikes et al., 2016) and another looked at nutrition for Alzheimer's patients (Suominen et al., 2015). Almost all studies must be led by

healthcare professionals, be they primary care physicians, nurses, or nutritionists. Most interventions developed require a team of experts as part of the services requirement. Usually, they function as an external multidisciplinary team that reviews the management or medication of the patient(s) and offers recommendations to the primary general practitioner who oversees the patient(s). Duration for the intervention was recorded as short as eight weeks to as long as one year.

Effect of the services on the elderly QOL

Most of the interventions reported no significant difference between the intervention and control group except for a few studies that mentioned significant differences between the studied groups or higher scores for the intervention or targeted group in all or some of the domains measured (Bosanquet et al., 2017; Wilson et al., 2017; Lewis et al., 2017; Suominen et al., 2015; Chao et al., 2015). Different tools were used to measure the intervention's outcome or effect. These included EQ-5D-3L (Bosanquet et al., 2017; Willeboordse et al., 2017), QALY (Wilson et al., 2017), Physical Health Questionnaires (PHQ) (Lewis et al., 2017; Bleijenberg et al., 2016), SF12 (Willeboordse et al., 2017) and KATZ-15 (Ruikes et al., 2016). Table I shows more detailed information on this.

Factors influencing the implementation.

Some studies mentioned possible factors influencing their intervention effect. The target population was reported in two studies whether they were either not the accurate or suitable target population or not the priority in the services (Lewis et al., 2017; Iliffe et al., 2014). There were several qualified professionals to offer the services, for example, nutritionists that specialised in nutrition for the elderly with Alzheimer's (Suominen et al., 2015). It was also challenging to balance the expert opinion on the effectiveness of clinical medication reviews and proven evidence of its effectiveness in a trial that showed nil success thus far (Willeboordse et al., 2017).

Table I Summary of studies included in the review (n:16)

No	Author (year)	Design (country)	Sample size	Primary Health Care intervention	Quality of life (QOL) impact
1.	Bosanquet K et al. (2017)	Randomised Control Trial (England)	N= 485 Intervention: 249 Control: 236	Collaborative care delivered by a case manager [a primary care mental health worker/Improving Access to Psychological Therapies (IAPT) worker] The case manager is a link between the participant and other professionals involved in their care. Collaborative care in the CASPER plus trial included telephone support, symptom monitoring and active surveillance, facilitated by a computerised Patient Case-Management Information System (PC-MIS) and low-intensity psychosocial management (behavioural activation).	EQ-5D-3L (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) - Majority participants indicated no problems or some problems, only few having severe difficulties (pain/discomfort dimension). - Number of patients who had no problems performing usual activities increased 9% at follow-up. - Negative anxiety and depression at collaborative care arm
2.	Wilson N et al. (2017)	Cohort (New Zealand)	N = 50,247 people	Home safety assessment and modification (HSAM) A personalized assessment of injury hazards in the home (generally by an occupational therapist), followed by the systematic removal of these hazards, includes removing tripping hazards, adding grab bars in bathroom and toilet areas, adding handrails to stairways, and improving home lighting	-The HSAM intervention produced considerable health gain and being cost-effective among people aged 65+ years in this health district setting in a high-income country. -The estimated health gain per capita in the 65+ year population was 0.066 QALYs which is equivalent to an extra 24 days of healthy life.
3.	Lewis H et al. (2017)	Randomised Control Trial (England)	Intervention n = 274 Control n = 327	CASPER trial is a collaborative care in older adults with subthreshold depression. A low-intensity programme of collaborative care using behavioural activation, designed specifically for those aged ≥ 65 years with subthreshold depression. Delivered by a case manager [a primary care mental health worker/Improving Access to Psychological Therapies (IAPT) worker]	PHQ-9 depression severity, and baseline SF-12 physical functioning. -Mean group differences ranged between 1.20 and 1.36 score points ($p < 0.010$). -Reduction in moderately to severely depressed cases (PHQ-9 score of ≥ 10) Statistically significant between-group differences in favour of collaborative care were observed for: - health-related quality of life (SF-12 PCS score; SF-12 MCS score) -psychological anxiety (GAD-7).

				<p>Collaborative care included telephone support, symptom monitoring and active surveillance, facilitated by a computerised case management system [Patient Case Management Information System (PC-MIS) and low-intensity psychosocial management (behavioural activation).</p>	<p>Other beneficial effects of collaborative care were seen for:</p> <ul style="list-style-type: none"> - EQ-5D anxiety/depression, mobility, usual activities and pain/discomfort - physical health (PHQ-15) - psychological resilience (CR-RISC 2).
4.	Holtzer-Goor KM et al. (2015)	Cross sectional (Netherlands)	N: 58 306	<p>Comparing current urinary incontinence (UI) management with new approach (assumed sensitive in finding patients who are incontinent, thus increasing the detection rate). The initial assessment and treatment by a nurse continence specialist (NS) start with a consultation with the NS, who will perform an initial assessment, establish a diagnosis and start treatment on that basis.</p>	<p>Health benefits were expressed in quality-adjusted life years (QALYS), where a quality-of-life weight is given to each of the 3 health states defined. QALY calculation based on utility value. The 3-health state defines patients spent in the various health states of</p> <ol style="list-style-type: none"> 1. Health state of success; 0.8595 2. Health state of improvement ; 0.84205 and 3. Incontinence (failure health state) ; 0.8246 <p>Total QALYs : usual care ; 2.4777 new care: 2.4829 , the difference: 0.005</p>
5.	Willeboordse F et al (2017)	Cluster Randomized Control Trial (Netherlands)	N= 426 Control, 211 Intervention, 215	<p>Clinical medication review: Four trained independent expert teams consisting of a GP or nursing home physician and a community pharmacist performed the Clinical Medication Review analysis.</p> <p>They performed the medication review according to the adapted Systematic Tool to Reduce Inappropriate Prescribing (STRIP) method including the Screening Tool of Older Person's Prescriptions (STOPP) and Screening Tool to Alert doctors to Right Treatment (START) criteria.</p> <ul style="list-style-type: none"> - Pharmacotherapeutic treatment plan (PTP): The expert team made a PTP which was sent to the patient's GP by fax or encrypted e-mail. - Implementation of the PTP: Patients were invited for a consultation with their GP in which the PTP was discussed and determined together with the patient. Changes in the medication were implemented usually by electronic communication from the practice to the pharmacy. 	<p>No significant differences between the intervention and control group and over time were found for QoL at 3 and 6 months, with either the EQ5D-3L and SF-12.</p> <p>In the intervention group, for 24.8% of the patients, the primary geriatric giants such as immobility, instability, incontinence and cognitive impairment was resolved and for 44.7% this was improved, compared to 23.0% and 41.5% in the control group.</p> <p>EQ5D utility scores and SF12 MCS, we found a statistically significant intervention effect after 3 months among intervention patients who had their consultation within 1.5 months, this effect was absent at 6 months.</p>
6.	Iliffe S et al (2014)	Cluster randomised controlled trial (United Kingdom)	N = 1256 Intervention: 798, Non-intervention, 458	<ol style="list-style-type: none"> 1) Home-based Otago Exercise Programme (OEP). A 30-minute programme of leg muscle strengthening and balance retraining exercises progressing in difficulty, performed at home at least 3x per week, and a walking plan to be undertaken at least two times per week. Duration: 24 weeks. Each participant received an instruction booklet and ankle cuff weights (starting at 1kg) to provide resistance for the strengthening exercises. 2) The fame programme 1-hour-long group exercise class in a local community centre for a 	<p>No significant differences were apparent at 12 months for either component of the SF-12 (mental or physical)</p>

				<p>maximum of 15 participants and two 30-minute home exercise sessions (based on the OEP) per week.</p> <p>Duration: 24 weeks.</p> <p>These classes were run by PSIS (postural stability instructors), trained to promote exercise with older people. Participants were advised to walk at least 2x per week for up to 30 minutes at a moderate pace. The fame intervention is a more comprehensive intervention, containing both floor exercises and cardiovascular exercises that the OEP does not contain, and is more intense.</p>	
7.	Suominen MH et al (2015)	Randomised control trial (Finland)	N= 99 Intervention, 50 Control, 49	<p>Duration of intervention: 1 year. Nutritionist (TMP) was the key person and must be trained in the nutrition of older adults and people with dementia. Home visit was arranged within one month after the baseline assessments.</p> <p>Intervention included tailored nutritional guidance on the basis of the food diaries, the results of the weight measurement, the home visits, and discussions with the participants and their caregivers held every three months.</p> <p>Participants received booklets about the assessment of adequate protein and calcium intake and the use of 20 µg/day vitamin D supplements, and a guide about balanced nutrition for older adults. The control participants received care in the normal community care, as well as they received a written guide about nutrition for older adults.</p>	<p>The total score on the fifteen dimensions (15D) of HRQOL: mobility, vision, hearing, breathing, sleeping, eating, speech, elimination, usual activities, mental function, discomfort and symptoms, depression, distress, vitality, and sexual activity.</p> <p>It showed that the HRQOL of participants in the intervention group increased by 0.006 (95% CI -0.016 to 0.028), whereas it decreased in the control group by 0.036 (95% CI -0.059 to 0.013) (p = 0.007, adjusted for age, sex, baseline MMSE and BMI). The dimensions of the 15D that showed differences between the intervention and control groups were mental functioning reflecting cognition, breathing, usual activities reflecting daily physical functioning and depression.</p>
8.	Rösstad T et al (2017)	Cluster randomised controlled trial (Norway)	N= 308 Intervention, 165. Control, 143	<p>The care pathway 'Patient Trajectory for Home-dwelling elders' (PATH) was introduced in Central Norway region in 2009 to ensure adequate predischarge planning and coordination between general hospitals and primary care for elderly patients in need of home care services after hospital discharge.</p> <p>Post-discharge follow-up by home care professionals and general practitioners (GPs) was structured to ensure adequate care of medical conditions, prevent functional decline and ensure sufficient social support by introducing checklists at defined stages in the patient trajectory.</p>	<p>The path and control groups did not differ with respect to the primary outcomes: functional level and readmissions, or the secondary outcomes: quality of life, mortality, and health care utilisation apart from more GP consultations (p = 0.04) in the PATH group</p>
9.	Bleijenberg N et al. (2016)	Cluster Randomized Controlled Trial (Netherlands)	N = 3,092 Intervention, 2236 Non-intervention, 856	<p>Intervention 1: Frailty Screening Followed by Routine Care from a General Practitioner</p> <p>The frailty screening intervention aimed to identify older adults at risk of adverse events using readily available routine care EMR data. Individuals aged ≥ 60</p>	<p>A screening intervention that used routine primary care data and was followed by a personalized nurse-led care intervention did not have a clear and convincing effect on daily functioning after 1 year of follow up. No statistically significant differences were observed between the three groups</p>

				<p>were considered at risk if they were at risk for frailty, were exposed to polypharmacy, or had not had a visit with their general practitioner (GP) for ≥ 3 years (consultation gap).</p> <p>Intervention 2: Frailty Screening Followed by Personalized Nurse-Led Care</p> <p>In the second intervention group, the personalized nurse-led care program followed application of the screening instrument. Twenty-one registered practice nurses delivered this care and were extensively trained during a 6-week training program (48 hours total). An expert panel of older adults, nurses, and GPs participated in the development of this program.</p>	<p>with respect to quality of life and satisfaction with care at 6- or 12-month follow-up</p>
10.	Yaman H & Atay E (2018)	Randomized Control Trial (Turkey)	N= 120 Intervention, 51 Control, 69	<p>General characteristics of the exercise prescriptions: Endurance 3–5 times per week and 15–30 min of duration; strength 2–3 times per week and in 13 sets; flexibility 2–3 times per week, in 13 sets and in 10–30 s each exercise; balance 2–3 times per week, 13 sets, and in 15–30 s each exercise.</p> <p>Patients in the intervention group (IG) received thorough counseling on exercise, whereas those in the control group (CG) only received 5–10 min of instruction. In addition, patients in the CG did not receive an exercise prescription or exercise pack.</p>	<p>There were significant differences ($p < 0.05$) on general health Perception, mental health scores which are subscales of QOL in the beginning. Several domains of the SF-36 changed because of the exercise intervention. Physical function, physical role function, body pain, mental health, vitality, and emotional role function scores were significant differences ($p < 0.05$) but not for social role function or general health perception scores.</p>
11.	Ruikes FG, et al (2016)	Cluster controlled trial (Netherlands)	N= 536 Intervention, 287 Control, 249	<p>Carewell primary care program, combines the professionals from cure, care, and welfare domains; proactive care planning; case management; and medication review and aims for the prevention of functional decline, maintenance of well-being, and prevention of institutionalization and hospitalization among community-dwelling frail elders. The carewell primary care program consisted of 4 key elements: multidisciplinary team meetings, proactive care planning, case management, and medication review.</p>	<p>The Katz-15 index score at baseline, no significant effects on functioning were found. No significant effects on quality of life, mental health, and health-related limitations in social functioning. No differences in residential and nursing home admissions, hospital admissions, and mortality were found. No effects of the carewell primary care program on functioning, quality of life, mental health, health-related social functioning, institutionalization, hospitalization, and mortality among community-dwelling frail elderly people in Dutch primary care.</p>
12.	Rossato SL et al. (2013)	Cross-sectional study (Brazil)	N= 511	<p>Providing care in basic health units (BHUS) for spontaneous demand or patients referred by other services. The organization and provision of services are based on risk groups or specific conditions.</p> <p>-The health care team includes internal medicine physicians, pediatricians and gynecologists, nurses and other health professionals.</p> <p>-Family Health Strategy (FHS), offers participative and comprehensive care, and a system of centralized coordination.</p>	<p>Score for quality of life for the physical component summary was higher in the BHU while the mental component summary was higher in the FHS.</p>

				The FHS involves health care implemented by nuclear teams, including a family doctor, a nurse, four community health workers, and other assistants.	
13.	Kallio ELet al. (2018)	Randomized Controlled Trial (Finland)	N= 147 Intervention, 76 Control, 71	<p>A systematic 12-week training program focused on subskills of executive function: attention, working memory, cognitive flexibility, and planning.</p> <p>Intervention group received cognitive training twice a week for 45 minutes.</p> <p>Control group underwent day care as usual.</p>	Systematic CT in a real-world setting did not have effects on global cognition or HRQOL in community-dwelling older persons with mild to moderate dementia.
14.	Chao J et al. (2015)	Randomised Controlled Trial (China)	N = 100 Intervention (management), 50 Control, 50	<p>Integrated health management model including the following components:</p> <p>(1) Health record establishment, which was implemented by specifically-trained community health service center staff;</p> <p>(2) Health evaluation, which was done by related researchers through the health evaluation software; and</p> <p>(3) Health management, including diet advice, individual psychological aspects of health, a tailor-made exercise program based on an earlier evaluation, education/skills training on health self-management, individual telephone consultation, group lectures on health and diabetes (the prevention and treat for the diabetic foot disease, the cardio-cerebrovascular complications, the diabetic nephropathy, rational life style, self-management, etc.), follow-up visits, regular blood glucose monitoring, long-term diabetes drug monitoring and distribution of health promoting materials, which were implemented by specifically-trained community health service center staff, managers and related researchers.</p> <p>Components of the intervention were 'administered' at least once per month by specifically trained community health service center staff, managers and related researchers.</p>	<p>Older adults with diabetes in the management group performed better than those in the control group on all subjective grading items (health knowledge score, self-evaluated psychological health status score, self-evaluated health status score, dietary score, physical activity duration per week, regular monitoring of blood sugar) ($P < 0.05$).</p> <p>Improvements in the management group were found in BMI, waist-to-hip ratio (WHR), diastolic pressure and fasting blood sugar compared with the control group ($P < 0.05$). For health service utilization, the days of hospital admissions in the preceding 6 months of management group reduced 1.74 days, while the control group increased 2.88 days, and there was statistically significant difference between the two groups ($P < 0.05$).</p>
15.	Vaillant-Roussel H et al. (2016)	Cluster randomised controlled clinical trial (France)	N = 141 Intervention, 115 Control, 126	<p>The GPs in the Intervention Group received a 2-day interactive workshop that trained them to deliver a patient education programme.</p> <p>The intervention consisted of patient education on standardised topics: clinical alarm signs, physical activity, diet and cardiovascular risk factors. The GPs were trained to manage their own education objectives (e.g., Diet, treatment adherence) and patients' objectives (e.g., To be</p>	<p>The intervention did not improved QOL compared to routine care.</p> <p>There was no difference between the groups in Minnesota Living with Heart Failure Questionnaire (MLHFQ) ($P=0.74$), SF-36 mental health ($P=0.57$) or SF-36 physical health ($P=0.58$) questionnaire scores at the 19-month follow-up examination.</p>

				able to walk their grandchildren to school).	
16.	Hoogendijk EO et al. (2016)	Cluster randomised controlled clinical trial (Netherlands)	N= 1147 Allocation group were Group 1= 456 Group 2= 227 Group 3= 238 Group 4= 226	GCM = geriatric Care Model. Trained practice nurses (n = 21), who were based at the primary care practices, worked together with primary care physicians (PCPs) and carried out the intervention at the patient level in four steps. Every six months, a practice nurse visited the frail older adult at home. (Step 1) During the first home visit, a multidimensional geriatric assessment was conducted using the interRAI Community Health Assessment (CHA) version 9.1. (Step 2) After each assessment, practice nurses wrote a tailored care plan in consultation with the PCP of the patient. (Step 3) During a second home visit, the practice nurse and the older adult formulated care goals and actions for the final care plan. During and after the intervention period, the older adult and the practice nurse evaluated the outcomes of the actions listed in the care plan. (Step 4) There was regular contact by telephone, and if necessary, an additional home visit was scheduled after 3 months. The GCM was managed by two geriatric expert teams (one in each region) consisting of an experienced geriatric nurse and a geriatrician.	No significant differences between the GCM and usual care were observed for the primary outcome, SF-12. No significant intervention effects were found with regard to EQ5D, ADL limitations, psychological wellbeing, self-rated health and social functioning. Implementing the GCM among frail older adults in primary care did not show beneficial effects on quality of life and other patient outcomes

Table II Study Quality Assessment by Downs & Black, 1998 (n:16)

Question	Bosanquet K et al.	Wilson N et al.	Lewis H et al.	Holtzer-Goor KM et al.	Willeboordse F et al.	Iliffe S et al.	Suominen MH et al.	Rösstaedt T et al.	Bleijenbergh N et al.	Yaman H & Atay E	Ruikes FG et al.	Rossato SL et al.	Kallio E Let al.	Vaillant-Roussel H et al.	Hoogendijk EO et al.	Chao J et al.
1. Is the hypothesis/aim/objective of the study clearly described?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
2. Are the main outcomes to be measured clearly described in the Introduction or Methods section?	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
3. Are the characteristics of the patients included in the study clearly described?	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y
4. Are the interventions of interest clearly described?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
5. Are the distributions of principal confounders in each group of subjects to be compared clearly described?	N	N	N	PARTIALLY	N	PARTIALLY	N	N	Y	N	Y	N	Y	PARTIALLY	Y	Y
6. Are the main findings of the study clearly described?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y

7. Does the study provide estimates of the random variability in the data for the main outcomes?

Y N Y N Y Y Y Y Y Y Y Y Y Y Y Y

8. Have all important adverse events that may be a consequence of the intervention been reported?

N (Not applicable) N Y N Y Y N N N N N N Y N N N

9. Have the characteristics of patients lost to follow-up been described?

Y N Y N Y Y Y N Y Y N N Y Y Y Y

10. Have actual probability values been reported (e.g. 0.035 rather than <0.05) for the main outcomes except where the probability value is less than 0.001?

Y N Y N N Y Y Y Y Y Y N Y Y Y WY

11. Were the subjects asked to participate in the study representative of the entire population from which they were recruited?

Y N Y Y Y Y Y Y Y N Y Y Y Y Y N

12. Were those subjects who were prepared to participate representative of the entire population from which they were recruited?	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N
13. Were the staff, places, and facilities where the patients were treated, representative of the majority of patients receive?	Y	N	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N
14. Was an attempt made to blind study subjects to the intervention they have received?	Y	N	N	N	N	N	Y	Y	Y	Y	Y	N	Y	Y	Y	N
15. Was an attempt made to blind those measuring the main outcomes of the intervention?	Y	N	N	Y	N	Y	Y	Y	N	Y	Y	N	Y	Y	Y	N
16. If any of the results of the study were based on "data dredging", was this made clear?	Y	N	Y	Y	Y	N	Y	Y	N	Y	N	N	N	Y	Y	Y

17. In trials and cohort studies, do the analyses adjust for different lengths of follow-up of patients, or in case-control studies, is the time period between the intervention and outcome the same for cases and controls?

Y N Y Y Y Y Y Y Y Y Y N Y Y Y Y

18. Were the statistical tests used to assess the main outcomes appropriate?

Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y

19. Was compliance with the intervention/s reliable?

Y Y Y Y Y Y Y Y N Y Y UNSURE Y Y Y y

20. Were the main outcome measures used accurate (valid and reliable)?

Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y

21. Were the patients in different intervention groups (trials and cohort studies) or were the cases and controls (case-control studies) recruited from the same population?

Y Y Y Y Y N Y Y N Y Y Y Y Y Y Y

22. Were study subjects in different intervention groups (trials and cohort studies) or were the cases and controls (case-control studies) recruited over the same period of time?	Y	unable to determine	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
23. Were study subjects randomised to intervention groups?	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y
24. Was the randomised intervention assignment concealed from both patients and health care staff until recruitment was complete and irrevocable?	Y	N	Y	N	Y	N	N	Y	N	Y	Y	N	Y	Y	Y	N
25. Was there adequate adjustment for confounding in the analyses from which the main findings were drawn?	N	N	Y	N	Y	Y	Y	N	N	Y	Y	N	Y	Y	Y	Y
26. Were losses of patients to follow-up taken into account?	Y	Y	Y	N	N	Y	N	Y	N	N	Y	Y	Y	Y	Y	Y

27. Did the study have sufficient power to detect a clinically important effect where the probability value for a difference being due to chance is less than 5%?

	Y	Y	Y	N	N	Y	N	Y	N	Y	Y	Y	Y	y	y	N
Total score	23	10	24	15	21	23	23	22	18	22	23	16	27	25	26	20

Discussion

Primary health care ensures the accessibility of health services in the community for individuals and families, aiming to achieve better health services for all. It is an approach to health that focuses on health equity, and the services are given at a cost that the community and the country can afford to maintain at every stage of their development in the spirit of self-dependency (World Health Organization, 1978). The aged population has been seen as an important issue in health care services in terms of their health care cost coverage due to their multi-morbidity and younger age dependency due to the reduction of their physical and cognitive function (van Rijckevorsel-Scheele et al., 2019). In preparation for aged societies, there is a need for well-equipped primary health care services with comprehensive and effective programs to improve the health of the elderly and their quality of life (Santos et al., 2019).

This systematic review examined the primary health care interventions implemented to improve the elderly's quality of life (QOL). Specifically, we want to identify and characterize the health intervention from the available literature in primary health care settings targeted at the elderly. The reviews also helped answer our question on the level of outcomes on QOL of the elderly after the intervention implementation and the factors related to the success of the programs (Santos et al., 2019).

We have included 16 studies out of 134 papers from 2013 to 2018, with an exclusion rate of 46 percent. Of the eligible papers to review, six papers were irrelevant to the objectives where the intervention was not implemented in a primary or community setting, and the target population was not specific for the old population. We have found that seven studies reported a positive QOL impact on the elderly after their intervention, while the rest reported negative or insignificant changes in QOL outcome.

The possible factors discussed for no significant change in QOL score include individualized participant characteristics, such as the elderly's education level, which influenced health literacy and communication skills (Bleijenberg et al., 2016). Other than that, on the intervention factor, the allocation of the professionals and the existing difference between the study groups may contribute to insignificant results (Ruikes et al., 2016). Other studies were commented on the small sample size with different types of dementia, and the dimension of QOL measured would not be expected to benefit from the intervention (Kallio et al., 2018). Long-term follow-up for disease-specific QOL largely had no significant effect compared to short-term intervention. For patients with high baseline QOL scores, such as those with stable heart failure, it was unrealistic to attempt to improve the QOL of this population (Vaillant-Roussel et al., 2016).

Two studies with apparently the same group of researchers have implemented collaborative care, where the earlier study was looking at active surveillance for screen-positive elders with a subthreshold or mild disorder of depression (Lewis et al., 2017). In contrast, the subsequent study targeted major depression among the elderly (Bosanquet et al., 2017). Both interventions had the same concept of care, but the later trial was more specific, and the outcomes were concerned with the anxiety depression dimension with cost impact, while the earliest trials used different scales of depression and the prevalence of depression cases with mortality rate.

From the studies in this review, the successful (improvement of QOL score) rate of implemented primary health care intervention was 56 percent. The factors that might influence health intervention effectiveness could be the duration of intervention implemented, collaborative effort or teamwork between the members or professionals, and the intervention that fills the needs of the targeted population. These were also agreed upon by a study on the effectiveness of intervention to reduce disparities among ethnic groups in healthcare (Jones et al., 2010).

A variety of measurement models used in quantifying the QOL of the elderly result in difficulty in statistical comparison. Even though the use of standard measurement, mainly SF-36, HrQOL, or EQ5D, makes it logical for comparison. The 16 studies have explained various types of interventions that are applicable in primary clinical settings. Thus, it is crucial to identify what is the methodology for improving the elderly population's QOL, specifically in primary health care settings (Santos et al., 2019). This is because a higher number of elderly people use primary health care facilities for their disease management and preventive health care. There are highly accessible and available primary care services, mainly general practice (GP) and health clinics, that are much better than secondary or tertiary care. As for that, the main focus of this review is on primary care programs in either private institutions or government settings.

The quality assessment tool used in this review was the Black and Down checklist because it could be used for randomized and non-randomized studies (Downs & Black, 1998). All the articles in this review had a mean score of 22 from a total score of 28, which could be considered as a moderate to good quality of studies.

Study limitations

We could not perform a meta-analysis because of the heterogeneity of the measurement model and the outcomes reported in the studies included and reviewed. There were a considerable number of parameters that could not be examined because the papers did not report them. Despite our use of a thorough search strategy, some empirical studies on primary health care intervention impact on elderly quality of life may not have been identified for this systematic review, examples on gray literature such as unpublished documents and reports.

Conclusion

As the global population ages, the need for comprehensive and effective interventions in primary healthcare becomes increasingly urgent. This review highlighted the importance of addressing the unique healthcare needs of elderly populations, particularly in low- and middle-income countries like Malaysia where demographic shifts outpace infrastructure development. While strides have been made in expanding hospital bed capacity and developing elderly care services in primary care settings, there remains a critical gap in understanding the effectiveness of these interventions in improving the quality of life (QOL) for older adults.

One of the key findings of this review is the diversity of interventions implemented in primary care settings to address the health needs of the elderly. From disease prevention and management to social and functional supports, these interventions aim to enhance the physical and mental well-being of older adults. However, the effectiveness of these interventions varies, with some demonstrating positive impacts on QOL while others show insignificant changes.

Furthermore, the assessment of intervention effectiveness primarily focuses on its impact on the QOL of the elderly. While this is a valuable measure, future research should also consider other outcome measures such as healthcare utilization, cost-effectiveness, and long-term health outcomes to provide a more comprehensive understanding of intervention effectiveness. Additionally, this review highlights the need for more specific research focusing on disease-specific interventions and management in secondary or tertiary care settings. Understanding which interventions are most effective for specific health conditions among the elderly can inform targeted approaches to healthcare delivery and resource allocation.

In conclusion, addressing the healthcare needs of aging populations requires a multifaceted approach that encompasses preventive, curative, and supportive interventions delivered through primary healthcare systems. By continuously evaluating and refining these interventions, policymakers, healthcare providers, and researchers can better meet the evolving needs of elderly populations and ensure their health and well-being in the years to come.

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