

# Are formal self-care interventions for healthy people effective? A systematic review of the evidence

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## ABSTRACT

**Introduction** Preventative interventions are shown to be effective in reducing 40% of the mortality due to unhealthy behaviours and lifestyles. Health-promoting self-care has been recognised as a promising strategy in preventative health. However, self-care research is being done around the self-management of chronic illnesses and the promotion of self-care practices among healthy populations has been overlooked by many healthcare systems.

**Method** The study methodology was a systematic review with a narrative synthesis. The search was done through seven academic databases, reference tracking of selected articles and grey literature. The scoping, selection, screening and quality assessments of the articles were reviewed independently by two reviewers.

**Results** Sixteen studies met the inclusion criteria. Self-care behaviour, health-promotive lifestyle changes and medical care utilisation were some of the main outcomes evaluated in the studies. Positive effects were seen in increasing self-care and health-promotive behaviours in most interventions although limited or mixed impact was seen in health attitudes, beliefs and utilisation of medical services. Most studies were from high income settings with low-quality study designs. The complexity of the word 'self-care' and inconsistencies in the terminology used in health-promotive self-care were significant highlights of the study.

**Conclusion** Health-promoting preventative self-care interventions show promise in increasing the well-being of healthy people. However, the methodological drawbacks limit the generalisability of the findings. As the demand for self-care interventions increases, the lack of a formal globally accepted definition and framework and complexity of behaviour change are key limitations to consider moving forward.

## INTRODUCTION

Preventative interventions, using health-promotive strategies, have been shown to be effective in reducing up to 40% of the mortality caused by unhealthy behaviours and lifestyles.<sup>1</sup> Health promotion, a core strategy in prevention, emerged in the 1980s creating a novel approach to public health interventions and practices.<sup>2</sup> Self-care is a form of

## Key questions

### What is already known?

- ▶ Health-promotive self-care is a growing area of health promotion that shows significant promise in outcomes and reduced expenditure but there is much less attention given to health-promotive self-care interventions for healthy populations.

### What are the new findings?

- ▶ Current studies are of low to moderate quality and majority are from high-income countries limiting the strength of the pooled effects.
- ▶ There is a clear lack of consistency in the terminology used in self-care resulting in varying intervention design, restricting the comparability of studies.

### What do the new findings imply?

- ▶ Develop a globally accepted definition and framework for health-promotive self-care and establish clear parameters of its use and definition.
- ▶ The need for more robust high-quality evaluation study designs for health-promotive self-care interventions using behaviour change theories and consistent follow-up methods to improve data quality.

health promotion, disease prevention and disease control, which is built on increasing personal commitment and responsibility to one's health. An overall accepted definition of self-care in health, and one that guided this review, is acquiring the necessary knowledge, skills and attitudes required to achieve and maintain good health.<sup>3</sup> In line with the third Sustainable Development Goal of *ensuring healthy lives and promoting well-being for all at all ages*,<sup>4</sup> self-care encourages a change in current public health approaches, and explores the processes involved in accessing primary care. Primordial prevention—that is, the prevention of emergent risk factors within a population—is a key consideration in understanding the relationship between self-care and health promotion.<sup>5</sup> This is important in encouraging non-diseased populations to adopt healthier lifestyles and social values. Health-promoting



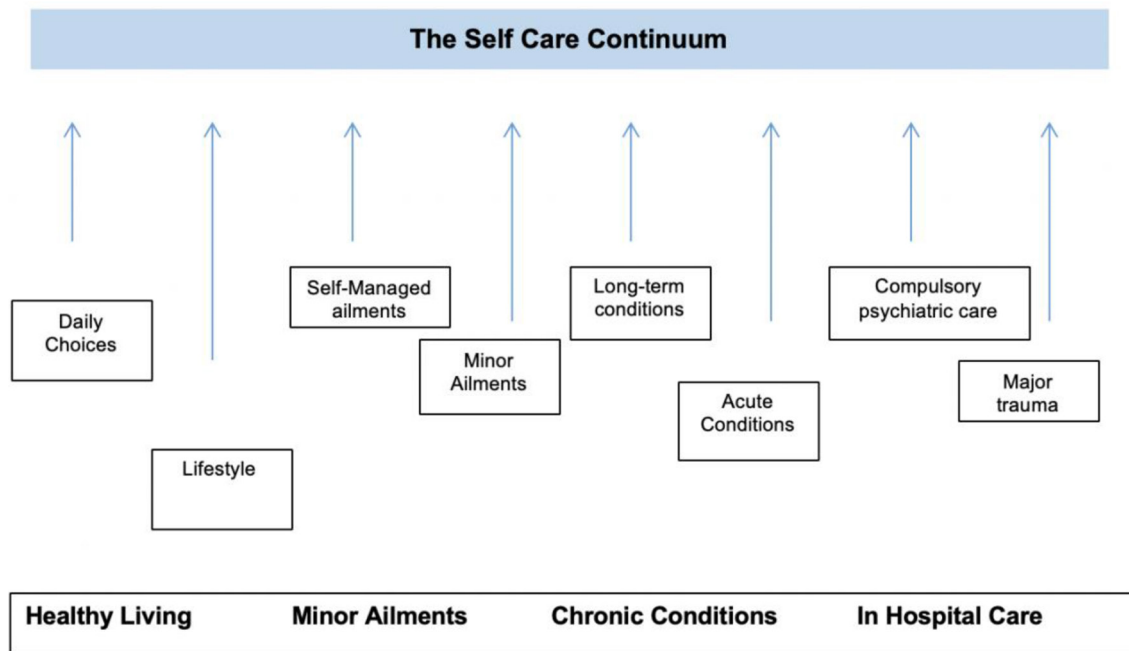
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**Figure 1** The self-care continuum.<sup>7</sup>

self-care is one such promising primordial preventative strategy and was the primary focus of this review.<sup>5,6</sup>

Illness type and an individual's unique situation determine the type of self-care behaviours they undertake. According to the Self Care Forum in the UK, self-care is a continuum ranging from daily health choices to recovery from a major trauma as illustrated in figure 1.<sup>7</sup> Health-promoting self-care behaviours would be classified to the left side of the spectrum which covers daily choices, lifestyle and self-managed ailments.

In many high-income countries (HIC), general practitioners (GP) are increasingly devoting a significant amount of time, dealing with minor illnesses, such as fever, cold, sore throats and ear infections, which are often amenable to self-care interventions using home remedies.<sup>8</sup> A rising concern for health systems in countries classified as high income, like the UK, is the increase in non-urgent emergency department attendances, with evidence suggesting that about 40% of emergency care appointments are diagnosed to be self-managed at home.<sup>9</sup> When advanced care is sought for minor illnesses, there is an increased financial burden on the healthcare system and an impact on the patient's well-being as a result of being deprioritised in emergency care,<sup>10</sup> highlighting the need for promotive self-care and raising public awareness. Importantly, the ideologies towards self-care and the adoption of its practice are influenced by a country's health system, provision of services, methods of health system financing and social values underlying each system.<sup>10</sup>

Previously, the main focus of self-care research was on self-management of chronic illnesses. There are now well-known formal programmes, mostly in HICs, designed to provide supported self-management to people with

chronic illnesses such as diabetes, asthma, mental illnesses, osteoarthritis and hypertension, and their effectiveness is well established.<sup>11</sup> Evidence also shows that gender, age, socioeconomic status (SES), self-efficacy and social relationships are determinants in the acceptance and engagement of health-promotive self-care interventions.<sup>5, 12-14</sup> There is, however, limited evidence on the effectiveness of such interventions for healthy individuals. This review, therefore, aimed to explore the overall effectiveness of preventative formal self-care programmes for healthy populations, by describing and documenting existing interventions and systematically assessing their effectiveness.

## METHODS

A systematic review of literature with a narrative synthesis<sup>15</sup> was conducted. This approach focuses on explaining and summarising the findings of multiple heterogeneous studies using text and words.<sup>15</sup> The research question and its parameters were further refined by applying the Population, Intervention, Comparator, Outcomes, Context and Study design framework to selected studies.<sup>16</sup> This also guided the development of the inclusion and exclusion criteria (box 1).

### Search strategy and study selection

Literature was identified from: a range of electronic databases (Medline, CINAHAL, EMBASE, PsycINFO, Cochrane Library, Campbell Collaboration, the Cost-Effectiveness Analysis Registry and Google Scholar); reference tracking of selected articles; and grey literature. The literature search included studies from inception to June 2016 which was the time of undertaking

## Box 1 Inclusion and exclusion criteria

### Inclusion

- ▶ Studies describing a formal programme of supported ‘self-care’ interventions with a preventative focus and encompassing healthy populations.
- ▶ Studies with a clinical study design including randomised controlled trials (RCT), cohort studies, case–control studies, ecological or cross-sectional studies.
- ▶ Studies that evaluated the effectiveness of the self-care intervention on health outcomes with a follow-up of more than 3 months.

### Exclusion

- ▶ Any study that had interventions that focused on self-management, self-help, self-monitoring or self-efficacy.
- ▶ Non-evaluative studies, commentaries and letters to editors.
- ▶ Studies that were not explicitly identified by the authors as focusing on self-care programmes or that did not have self-care as a basis for the intervention.

this study. Further articles were identified by reviewing reference lists of all eligible articles. Development of the search strategy started with an initial scoping review on Medline using preliminary search terms that had been agreed on by the review team. Subsequently, three articles that fit the review criteria were used as a template to examine the keywords that it uses to be indexed in databases. A list of these terms (table 1) was then developed and each term entered into PubMed to find its related MeSH terms. Screening of identified literature was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses framework as illustrated in figure 1.<sup>17</sup> The three-stage screening process involved title screening, abstract screening and full-text screening.

**Table 1** Search terms used

	Search terms
<i>Self-care</i>	self-care OR self AND care OR self care
<i>Evaluation</i>	evaluation studies OR evaluation studies as topic OR evaluation effectiveness AND evaluation studies OR evaluation studies as topic OR evaluation
<i>Illness prevention</i>	Illness AND prevention and control OR prevention AND control OR prevention and control OR prevention
<i>Preventative health</i>	Preventative AND health OR health
<i>Proactive care</i>	Proactive AND care
<i>Health promotion</i>	health promotion OR health AND promotion OR health promotion AND programs
<i>Adult</i>	adult OR adults OR
<i>Lifestyle interventions</i>	life style OR life AND style OR life style OR lifestyle AND interventions

## Data synthesis and quality assessment of studies

Self-care interventions are highly heterogeneous in design and outcomes. Therefore, this review analysed the included articles using only a descriptive and narrative synthesis and a meta-analysis was not conducted. Data analysis was focused on evaluating the different measures of health outcomes that indicated behaviour change, and thus the overall effectiveness of self-care interventions for healthy populations. The methodological quality of selected studies was assessed using the Quality Assessment Tool for Quantitative Studies by the Effective Public Health Practice Project.<sup>18</sup> The quality assessment of the included studies is shown in table 2. This tool was considered suitable as it was specifically developed to evaluate public health studies and is adapted to accommodate for heterogeneity of interventions.<sup>18</sup> All studies in the review were assessed for selection bias, study design, confounders, blinding, withdrawals and dropouts, intervention integrity and analyses. The scoping, screening and data extraction stages of the review process were independently conducted by two reviewers, and all conflicting ideas were discussed until a consensus was reached. This assessment tool<sup>18</sup> allows the assessment of each of these sub areas of the study and applies one of the three ratings: strong, moderate or weak, depending on the information provided in the article. A global rating was given for each article where a study is recognised as ‘strong’ if it had no weak ratings, ‘moderate’ if it had one weak rating and ‘weak’ if it had two more weak ratings. The quality assessment was carried out independently. The quality assessment was also carried out independently by two reviewers and any clarifications discussed.

## Patient and public involvement

As this study is a systematic review, this review was conducted without patient involvement. Patients were not invited to comment on the study design and were not consulted to develop patient-relevant outcomes or interpret the results. Patients were not invited to contribute to the writing or editing of this document.

## RESULTS

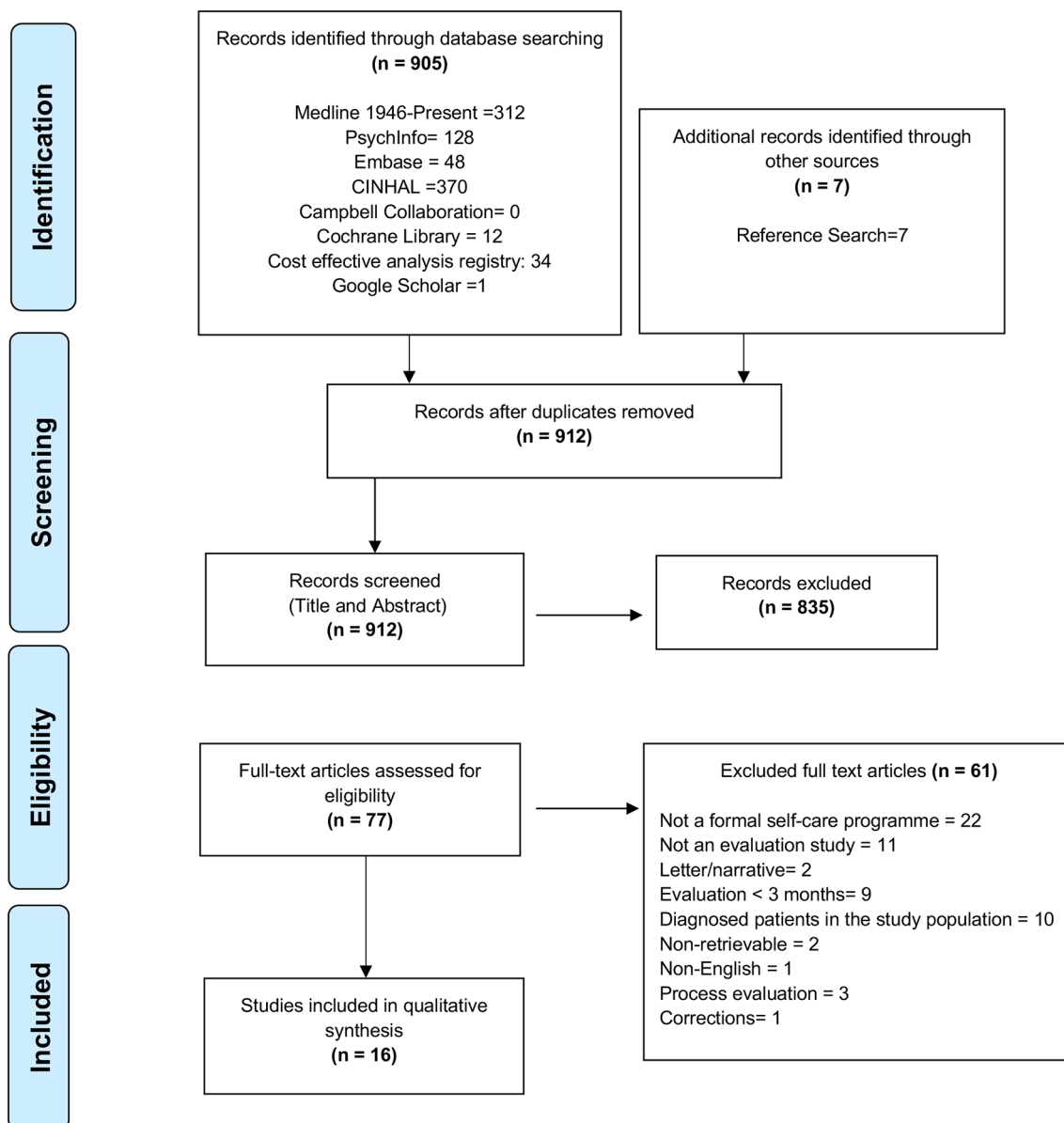
From the academic database search, 905 articles were identified (see breakdown in figure 2). Seven additional studies that met the inclusion and exclusion criteria were identified through reference lists. A total of 835 articles were excluded after title and abstract screening and 77 articles were left for the full-text review. A total of 16 articles were included in the final review.

The included studies were published between 1982 and 2008 with 12 studies from the USA. The remaining four studies took place in the Islands of Hawaii,<sup>19</sup> Egypt,<sup>20</sup> Turkey<sup>21</sup> and the UK.<sup>22</sup> Based on the assessment, the methodological quality of majority of the studies was rated low with a few studies rated as moderate quality (refer to table 3). The majority of the study designs were randomised controlled trials (RCT),<sup>23–26</sup> quasi

**Table 2** Quality assessment of included studies (Effective Public Health Practice Tool)<sup>18</sup>

First author and date (listed in alphabetical order)	Selection bias	Study design	Confounders	Blinding	Data collection methods	Withdrawals and dropouts	Intervention integrity	Analysis	Global rating for the paper
Altun, 2008 <sup>21</sup>	Weak	Moderate	Weak	Moderate	Strong	Strong	NA	NA	Weak
Ball, 2002 <sup>27</sup>	Weak	Strong	Weak	Moderate	Strong	Strong	NA	NA	Weak
Benson, 1989 <sup>28</sup>	Weak	Strong	Moderate	Moderate	Weak	Strong	NA	NA	Weak
Caserta, 2001 <sup>30</sup>	Weak	Moderate	NA	Moderate	Weak	Strong	NA	NA	Weak
Hartweg, 1986 <sup>31</sup>	Weak	Moderate	Strong	Moderate	Strong	Moderate	NA	NA	Moderate
Kemper, 1982 <sup>23</sup>	Weak	Strong	Strong	Moderate	Moderate	Weak	NA	NA	Moderate
May, 1994 <sup>34</sup>	Moderate	Weak	NA	Moderate	Weak	Weak	NA	NA	Weak
Nelson, 1984 <sup>29</sup>	Weak	Strong	Strong	Moderate	Weak	Moderate	NA	NA	Weak
Porter, 1992 <sup>20</sup>	Weak	Strong	Weak	Moderate	Strong	Weak	NA	NA	Weak
Roberts, 1989 <sup>19</sup>	Weak	Strong	Strong	Moderate	Weak	Weak	NA	NA	Weak
Seideman, 1990 <sup>24</sup>	Weak	Strong	Strong	Moderate	Strong	Moderate	NA	NA	Moderate
Stark, 2005 <sup>32</sup>	Weak	Moderate	NA	Moderate	Strong	Weak	NA	NA	Weak
Timmerman, 1999 <sup>33</sup>	Weak	Moderate	NA	Moderate	Weak	Strong	NA	NA	Weak
Vickery, 1988 <sup>25</sup>	Strong	Strong	Weak	Moderate	Moderate	Weak	NA	NA	Weak
Vickery, 1983 <sup>26</sup>	Weak	Strong	Strong	Moderate	Moderate	Moderate	NA	NA	Moderate
White, 2012 <sup>22</sup>	Moderate	Moderate	Moderate	Weak	Strong	Weak	NA	NA	Weak

NA, not applicable.



**Figure 2** Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram.

experimental studies<sup>19 20 27–29</sup> and cohort studies.<sup>21 22 30–33</sup> The type of evaluation design used for 14 of the selected studies included a pre-post design where the follow-up periods varied in length.<sup>19–32</sup> The follow-up times ranged from 2 months to 1 year and outcomes were evaluated at multiple points. See [table 1](#) for details of the included studies.

The formal self-care interventions ranged from: university health promotion courses,<sup>21 27 31 33</sup> community-based educative self-care programmes,<sup>19 20 22 24 28–30 34</sup> integrated interventions<sup>23</sup> and informal interactions.<sup>25 26</sup> The target populations of the selected studies were diverse and included university students,<sup>21 27 31–33</sup> the elderly,<sup>19 28–30</sup> general clinic population,<sup>22 23 25 26</sup> the homeless,<sup>34</sup> Egyptian mothers<sup>20</sup> and women experiencing moderate or severe menstrual symptoms.<sup>24</sup> The samples were predominately female in the selected studies. The methods of data collection varied from self-administered questionnaires,

standardised data collection tools, independent records and interviews. Programme impact was evaluated in five studies<sup>19 23 28 30 34</sup> and participation rates were not reported in four studies.<sup>19 27 32 34</sup> Three studies<sup>19 28 34</sup> had positive programme feedback in increasing health knowledge and changing behaviour. All the studies in this review used self-reported data collection methods where participants were asked to recall their behaviours and express their attitudes on a given topic. The included studies in this review were synthesised under three main categories: effectiveness based on intervention characteristics, impact on health-related outcomes and the cost-effectiveness of the interventions.

#### Intervention effectiveness based on mode of delivery

In the four studies that included a university course,<sup>21 31–33</sup> lectures were the main method of delivery with group discussions, videos, self-assessments and formulation

**Table 3** Summary of included studies evaluating the effectiveness of self-care interventions in healthy populations

Intervention characteristics			Study characteristics				Quality assessment	
Author, year	Country	Intervention	Target population and sample size	Participants, n	Study design	Evaluation design	Results	Quality assessment
Altun, 2008 <sup>21</sup>	Turkey	Health promotion course on the enhancement of self-care agency and health-promoting behaviours through 30 hours of classroom lectures via lectures, group discussions and instructional videos.	University students	41 students	Cohort study	Single group; pre-post evaluation within a 15-week semester	Self-care agency scores and health promotion behaviours all showed significant increase after intervention.	Weak
Bail and Bax, 2002 <sup>27</sup>	USA	Educational intervention with a self-care component in a classroom format to promote healthy behaviours and positive emotional adjustment during the semester. The self-care intervention was supplemented by self-awareness feedback sessions for some participants.	Medical students	32 men and 22 women	Cohort study	Pre-post evaluation design	Those in the self-care intervention had a higher likelihood of having consistent sleeping times, increased exercise frequency and less trouble falling asleep, but alcohol consumption was not affected.	Weak
Benson <i>et al</i> , 1989 <sup>28</sup>	USA	'Staying Healthy After Fifty': a nationwide educational programme for the elderly based on a previous programme comprising 11 sessions.	General elderly population	161 intervention participants 164 control group participants	Quasiexperimental trial	Intervention and control group; pre-post evaluation with a 6-month follow-up	The intervention group scored higher in health skills, health actions and health costs scale. The improvement continued over time.	Weak
Caserta <i>et al</i> , 2001 <sup>30</sup>	USA	'Pathfinders' is a formal self-care and health education programme for older widows and widowers covering a range of health-promotive topics in 11 weeks. Delivered by experts in a classroom format using lectures, group discussion, goal setting exercises and distributing written information. A grief counsellor was also present.	Older widows and widowers	84 widows and widowers	Cohort study	Single group; pre-post evaluation with 2 and 4 months' follow-up	The attendance rate for the programme was 71% and participants scored high on behavioural intention and behavioural attitude. Learning to take care of themselves was the most important benefit for the study participants.	Weak
Hartweg and Metcalfe, 1986 <sup>31</sup>	USA	Self-care curriculum based on Orem's self-care deficient theory which was incorporated to the university courses throughout the nursing degree programme.	Nursing students	40 nursing students and 71 non-nursing students	Cohort study	Pre-post design; beginning of the programme and follow-up after 3 years once the course was over.	Nursing students had a significantly stronger attitude towards self-care than non-nursing students. Area of residence is a confounding factor.	Moderate
Kemper, 1982 <sup>23</sup>	USA	An informal self-care educational programme of 10 sessions targeting symptom monitoring, lifestyle changes and confidence building. It was led by a nurse practitioner and reading material was provided.	General population	Experimental group: 107 families Control group: 110 families	Randomised controlled trial	Pre-post design with 6 and 12 months' follow-up	Self-care knowledge increased by 125% in the intervention group and only 8% in the control group. The increment was consistent during both follow-up periods. The intervention was also shown to be cost-effective in that the intervention group accrued less medical costs than the control group.	Moderate
May and Evans, 1994 <sup>34</sup>	USA	Health education programme with a health promotion and prevention focus for known health problems of the homeless. It was conducted in a classroom format using lectures and presentations by community health nurses.	Homeless population	2404 homeless clients from 13 urban shelters and treatment sites	Cross-sectional study	Repeated questionnaires given to the intervention over the intervention period of 18 months.	98% of the participants found the presentations to be useful. Positive programme evaluation was assumed to have positive outcomes.	Weak

Continued

**Table 3** Continued

Intervention characteristics		Study characteristics			Quality assessment			
Author, year	Country	Intervention	Target population and sample size	Participants, n	Study design	Evaluation design	Results	Quality assessment
Nelson <i>et al</i> , 1984 <sup>29</sup>	USA	A self-care education programme with 13 classes with reinforcement activities that continued for a year where clinical medicine, lifestyle and independent living were all addressed. It was delivered by a trained team through group discussions, skill training, role-playing and self-contracting.	Elderly population	341 individuals from New Hampshire	Quasiexperimental trial	Interviews were conducted by trained interviewers and a skills performance was conducted after intervention and at 1-year follow-up.	Intervention group showed more confidence in self-care tasks and the gains did not decrease over time. The lifestyle changes attempted were higher for the intervention group but these increments did not sustain over time.	Weak
Porter <i>et al</i> , 1992 <sup>20</sup>	Egypt	'Parental Enhancement Program,' an educational supportive programme which included systematically planned classes delivered face to face using discussions and role-play.	Egyptian mothers	58 mothers	Quasiexperimental trial	Pre-post evaluation design with 3 months, 6 and 12 months' follow-up.	Self-care agency, self-esteem and maternal perception showed no changes in the intervention group. The control group showed positive self-care agency and self-esteem scores.	Weak
Roberts <i>et al</i> , 1989 <sup>19</sup>	Islands of Hawaii, Oahu and Maui	'Staying Healthy After Fifty,' a nationwide educational programme for the elderly of 11 sessions culturally adapted to suit the Hawaii Asian-American population.	Elderly population	89 questionnaires from the course group 166 questionnaires from the comparison group	Quasiexperimental trial	Pre-post evaluation design with 3 and 6 months' follow-up	Course participants scored higher in health skills, health actions, healthcare costs and use of medical reference book. The improvements continued over time as well.	Weak
Seideman, 1990 <sup>24</sup>	USA	'Premenstrual Syndrome Educational Program' done in a classroom setting using presentations. Information sessions on PMS, lifestyle discussions and booklets were used to disseminate information.	Women experiencing moderate to severe PMS symptoms	47 women	Cohort study	PMS symptoms were recorded over 3 months and participants were contacted at 2-week intervals for reinforcement.	The intervention group reported significantly lower occurrences of PMS symptoms, lower severity of the symptoms and lesser number of days with premenstrual symptoms.	Moderate
Stark <i>et al</i> , 2005 <sup>32</sup>	USA	'Nurse's Role in Facilitating Health and Self-Care,' a semester-long educational university self-care course that included a lifestyle self-care plan and a self-care assessment delivered in a classroom format.	Nursing students	67 nursing students	Cohort study	Single group; pre-post evaluation with a mid-semester and end-of-semester evaluation	Participants significantly changed their lifestyle behaviours and older students had more health-promoting behaviours and health responsibility.	Weak
Timmerman, 1999 <sup>33</sup>	USA	Health promotion course focused on developing a lifestyle self-care plan (LSCP) delivered in a classroom format, covering health promotion topics of nutrition, exercise and stress management.	Nursing students	95 students	Cohort study	Mid-post evaluation with a 6-month follow-up	Immediately after the intervention only 42.1% had achieved their goal. At the 6 months' follow-up 52% of the participants had achieved their lifestyle goals.	Weak
Vickery <i>et al</i> , 1988 <sup>35</sup>	USA	The self-care intervention was a mixed intervention with three options of written materials, telephone information service and an individual counselling session. Group 1: written materials, telephone service and individual counselling. Group 2: written materials and telephone service. Group 3: written materials only. Group 4: no intervention	General population	1625 households	Randomised controlled trial	Pre-post evaluation design with 12 months' follow-up	All experimental groups showed a significant decrease in ambulatory care utilisation in comparison to the control group. The intervention was found to be cost-effective in comparison to usual or no care. The telephone information service was not used as anticipated (<20 calls per year).	Moderate

Continued

Table 3 Continued

Intervention characteristics			Study characteristics			Quality assessment		
Author, year	Country	Intervention	Target population and sample size	Participants, n	Study design	Evaluation design	Results	
Vickey <i>et al</i> , 1983 <sup>23</sup>	USA	'Cooperative Health Education Programme' aimed to assess medical care utilisation using a written material and a telephone information service.	General population	1249 individuals	Randomised controlled trial	Pre-post design with 6 and 12 months' follow-up	Significant reductions in total ambulatory visits and a decrease in all medical care provider utilisations by the intervention group. The telephone information service was not used as anticipated. Written material was used the most.	Weak
White <i>et al</i> , 2012 <sup>22</sup>	UK	A policy-driven community self-care intervention exploring the attitudes and skills related to self-care and healthcare delivered by Self Care Support Coordinators in Primary Care Trusts in small group sessions.	General population	1568 participants were included in the study.	Quasiexperimental trial—cohort study	Prequestionnaire with 6 and 12 months' follow-up. Participant health data were analysed 1 year before the study as well.	No detectable differences in the number of GP consultations or perceived health status. Small positive effects on psychological outcomes that include self-esteem, anxiety and subjective well-being.	Weak

GP, general practitioner; PMS, premenstrual syndrome.

of lifestyle self-care plans used to enhance learning. All four studies had positive effects in improving self-care behaviour, with three of them showing improvements in other health-related outcomes.<sup>21 31 32</sup> Eight studies used face-to-face interventions and positive changes in health-promotive outcomes were in four studies.<sup>23 24 30 34</sup> However, interventions that were exclusively face to face had no significant impact on medical care utilisation<sup>22</sup> or on health-related outcomes.<sup>20</sup>

Written materials combined with other methods were used to conduct the intervention in seven studies. Significant improvement in self-care behaviour and other health outcomes was seen in six of the seven studies with mixed findings in the remaining one. Two of the 16 included studies used written materials with a telephone service,<sup>25</sup> and written materials with one-on-one counselling.<sup>26</sup> Although the telephone service had very limited use in both studies, a significant decrease in the utilisation of medical services was measured in both. In the intervention group that used written material only as in the mode of information delivery, it was reported to be more cost-effective when combined with one-on-one counselling.<sup>26</sup>

### Effectiveness on health-related outcomes

Self-care interventions were found to be most effective among elderly populations<sup>19 28–30</sup> and student cohorts,<sup>21 27 31–33</sup> with mixed findings among the general population studies.<sup>22 23 25 26</sup> The change in lifestyle behaviour was maintained in follow-up in two out of the three<sup>19 28</sup> studies that targeted elderly populations.

Given the heterogeneity of the interventions analysed for this review, there were numerous outcome measures considered. Overall, self-care behaviours that include self-care attitudes, self-care knowledge, self-care strategies and self-care agency were evaluated explicitly in seven studies.<sup>20 21 23 25 29 31 33</sup> Outcomes related to health knowledge, health behaviour, changes in attitudes and lifestyle changes were measured in nine studies.<sup>19 21 25 27–30 32 33</sup> Only one study conducted a process evaluation.<sup>34</sup> Utilisation of medical services, which included visits to the GP, ambulatory care, emergency and laboratory care, was measured in seven studies<sup>19 22 23 25 26 28 29</sup> and cost-effectiveness of the intervention was measured in three studies.<sup>23 25 26</sup> Demographic data were collected from all studies but one.<sup>34</sup> Other outcomes assessed in the studies were participation rates, depression, maternal perception, self-esteem and programme evaluation outcomes.

Out of the seven studies that examined overall self-care behaviour as an outcome, four studies showed an improvement in self-care behaviour.<sup>21 23 29 31</sup> A significant positive increase in self-care knowledge and attitudes and increased confidence to perform self-care tasks like emergency self-checks which included checking for pulse, swollen glands and performing the Heimlich manoeuvre and sustained effects of the improvement in self-care behaviour was highlighted in three studies.<sup>23 29 31</sup> One study targeting mothers of lower SES showed a negative impact on self-care behaviour after the intervention.<sup>20</sup>



Lifestyle behaviours such as exercise, stress management, nutrition habits, sleeping behaviour and alcohol consumption were measured in seven studies.<sup>19 21 27–29 32 33</sup>

Two of those studies<sup>21 32</sup> used the Health-Promoting Lifestyle Plan-II scale as a measurement tool. After the intervention, a significant improvement in health-promoting lifestyle changes including health skills and actions was detected in four of the seven studies.<sup>19 21 28 32</sup> Improved sleeping behaviour and increased exercise frequency was observed in the study by Ball and Bax but no differences in alcohol consumption were detected.<sup>27</sup>

Health attitudes including beliefs and perceptions were examined in four studies<sup>19 22 28 30</sup> where thoughts about one's emotional self and cognition were recorded. The outcomes showed mixed impact with only small positive effects on anxiety, self-esteem, health literacy and recovery locus control.<sup>22</sup> Other health outcomes that were evaluated in the studies included premenstrual syndrome symptoms, self-esteem, emotional and academic adjustment and depression which showed no significant or sustained changes over time.<sup>20 24 27</sup> Additionally, an increased ability to communicate with the physician was reported in one study.<sup>29</sup>

### Cost-effectiveness of the interventions

Only 3 of the 16 studies measured cost-effectiveness. In all three, the intervention groups accrued less health costs compared with the control group.<sup>23 25 26</sup> For example, two different studies by Vickery *et al* on medical self-care education for elders showed cost-benefit ratios of \$2.19<sup>25</sup> and \$2.29–\$3.29,<sup>26</sup> respectively, for every dollar spent on the intervention. Furthermore, the savings due to decreased medical visits exceeded the intervention costs significantly. Kemper,<sup>23</sup> in their informal self-care educational programme, also found that the intervention group was more cost-effective than the control group with a cost difference of about \$2.22 between the groups. In Kemper's study, cost savings per family were \$55.25 which calculated a cost saving of \$101.27 per participant.<sup>23</sup> Significant decreases in hospital and minor illness care utilisation were also reported.<sup>26</sup> Further, studies done in the USA<sup>25 26</sup> showed decreased medical care utilisation although the UK study showed no change in the number of GP visits.<sup>22</sup>

### DISCUSSION

The aim of this review was to explore the overall effectiveness of preventative formal self-care programmes for healthy populations in improving health outcomes. The pooled effects of the 16 studies included in this review found mixed evidence for the effectiveness of preventative self-care interventions. Six of the 16 studies included in this review explicitly examined self-care behaviour with four showing improvements in self-care-related behaviour after intervention. Similarly, six of the eight studies that measured health-promotive behavioural change showed positive improvement. Health beliefs and

attitudes showed little or no significant change. Self-care interventions were most effective among elderly populations and student cohorts, with mixed findings among the general population. Interventions were found to be cost-effective in comparison to no or usual care in all the three studies that reported this. 87.5% of the included studies in this review are from HICs with 75% from the USA. Only two studies (12.5%) are from low/middle-income countries (LMIC). This indicates that self-care and health promotion for healthy populations is more recognised as a health concern and priority in HICs than LMICs.

Despite the studies in this review having used designs that are considered to be strong or 'gold standard', (RCTs, quasiexperimental or cohort), the generalisability of their results is limited due to sampling and reporting biases, and the lack of consideration for confounding factors. Eight of the 16 studies had small samples and relied on convenience sampling methods which included self-selection of the participants, introducing a volunteer bias. The other eight studies with larger samples had high dropout rates and low participation at follow-up points. The role of the researcher was overlooked in 13 studies where blinding was not discussed at the intervention stages nor in the analysis stages. Furthermore, there was a lack of consideration for confounding factors such as gender, age and level of education which could impact the transferability of the outcomes in practice.

Recording and understanding long-term behaviour change is an existing challenge in the field of health promotion.<sup>35</sup> The varied and inconsistent patterns of follow-up in the included studies limited the ability of this review to draw conclusive inferences about long-term behaviour change.<sup>35</sup> A systematic review done in 2011 by Fjeldsoe *et al* exploring maintenance of behaviour in exercise and dietary changes showed that only 35% of intervention trials reported maintenance outcomes, and highlighted the importance of recording, reporting and developing a common understanding of behaviour maintenance.<sup>36</sup> Additionally, a study by Ryan *et al*, examining the relationship between health behaviour and the self-determination theory,<sup>37</sup> showed that addressing an individual's psychological needs such as autonomy, relatedness and competence results in increased engagement and maintenance in health behaviour. Thus, interventions rooted in health promotional theories<sup>38</sup> that address psychological factors in behaviour change could address the limitations in sustained health behaviour change.

Consistent with previous work by Deeks *et al*<sup>39</sup> on the effects of gender and age on health behaviours and Acton and Malathum in 2000 on health-promotive self-care behaviour in adults,<sup>5</sup> this review found that self-care interventions were most effective in elderly populations. This could potentially be due to their increased engagement with health and social care services compared with younger individuals. Furthermore, as observed in other studies<sup>5 36</sup> positive lifestyle behaviour changes were more likely to be sustained in older population groups

compared with the general population.<sup>5 38</sup> This is in line with health promotion theories which posit that younger individuals may have less incentive and motivation to sustain healthy lifestyle behaviours. This could be due to optimistic bias, where one perceives that they are less likely to experience a negative event, or social and cultural influences that limit younger people engage in health-promoting behaviour.<sup>38</sup>

This review also indicates that the interventions were effective in improving self-care and health-promotive behaviour in university students. As the interventions were integrated into academic work, student populations may have a higher incentive to be more compliant to self-care interventions than the general population. Furthermore, the special interest of self-care in nursing students could have additional explanations including that self-care practices are mostly promoted and taught by nurses in clinical settings.<sup>32</sup> This increases the need for nursing staff to have insight to the practice of developing self-care behaviour plans.<sup>32 33</sup> Nonetheless, studies with medical students have shown more limited effectiveness and poorer health behaviours,<sup>40</sup> which could be attributed to the nature of the work in the health sector and its various stressors.

Differences in healthcare systems and methods of financing impact on uptake and sustainability of health-promoting self-care behaviour. This is highlighted in the interventions done in the USA which showed decreased medical care utilisation, with no changes in the number of GP visits for the intervention participants in the UK study.<sup>22 25 26</sup> An analysis of the Organisation for Economic Co-operation Development healthcare utilisation rates in 2016<sup>41</sup> showed that health systems that are financed through public funds like in the UK have increased utilisation rates. On the contrary, privately financed health systems, like in the USA, may have the 'unintended consequence' of encouraging communities to be more responsive to health interventions due to the direct financial impact of accessing medical services.<sup>41 42</sup> The role of the broader healthcare system is an area that warrants further investigation. This may provide insight into the impact that the levels of dependency on healthcare and its wider determinants of health-promoting self-care ideologies exist among different populations.<sup>5 6</sup>

Majority of interventions in this review had a face-to-face component in delivery supplemented with written materials and demonstrations. These multicomponent interventions were shown to be more effective than those that were face to face only. Works by Kaufman *et al*<sup>43</sup> and Kiropoulos *et al*<sup>44</sup> indicate that the impact of face-to-face only interventions in changing health knowledge and behaviour is mixed and dependent on the target behaviour of the intervention, suggesting a need for multicomponent interventions. This review also showed that interventions comprising only written materials were as effective as other interventions that used more engaging techniques, specifically in terms of medical service utilisation. This could have been due to the fact

that most of the interventions were group based. Group dynamics have been shown to impact on communication<sup>45</sup> which could potentially limit the effectiveness of face-to-face communication. In contrast to the findings of this study, a systematic review conducted on the effectiveness of multifaceted interventions by Squires *et al*<sup>46</sup> showed limited support for multicomponent interventions in comparison to single constituent interventions. This suggests a need for further research examining the effectiveness of different modes and approaches of intervention delivery.

### Limitations

A key limitation of this review was that the majority of studies that were included were published in the 1980s and 1990s. One explanation for the lack of recent studies could be the change and overlap in terminology used in preventative self-care and health education. Over time, terms such as self-management, self-help, self-efficacy and health education have been used synonymously with self-care. Also, many of the recent interventions that focus on prevention do not explicitly mention self-care as a primary outcome, but address specific aspects of self-care behaviour such as exercise, nutritional habits, sleep patterns or hygiene.<sup>47 48</sup> This means that rarely will overall self-care as an outcome in and of itself be evaluated in a formal systematic manner.

Furthermore, this change in terminology over time and lack of a 'globally accepted' definition for formal self-care interventions created a significant challenge for the authors in limiting the boundaries of the articles to be included in this review. Hence, this review was limited to formal interventions that explicitly looked at 'self-care' as a labelled outcome. While this could have had an impact on the comprehensiveness of the included studies in this review, it is also an indication of the interchangeability of terminology and lack of formal definition for self-care variables in the field of health promotion. Additionally, there was an over-representation of studies from North America (specifically the USA) with little or no representation from all other regions, highlighting the dearth in literature in health-promotive self-care programmes for healthy populations in other regions and particularly in LMICs.

Cultural beliefs and appropriateness are key considerations in understanding the health promotion climate of a setting and play a significant role in health beliefs and behaviour change.<sup>49</sup> The studies included in this review generally did not consider culture and its impact on health-promotive self-care behaviour. Thus, the effectiveness and impact of the interventions may be limited as placebo effects that stem from cultural beliefs and implicit personal practices were not captured in these studies.

### CONCLUSION

Self-care initiatives are being encouraged as an important part of healthcare in various forms across the globe.<sup>50</sup> This review contributes important knowledge to the effectiveness of existing programmes that target

healthy populations. Nonetheless, the overall evaluation of self-care interventions could be improved if quantitative outcomes were measured using standardised scales, combined with qualitative evidence to capture target users' perspectives. There is a need to develop a systematic framework to define, understand and implement health-promotive self-care interventions across different healthcare settings, and to develop a common global definition for self-care and management. Long-term behaviour change and maintenance should be prioritised in intervention design with consensus among healthcare entities on how to report and measure outcomes over time.

As this review highlights, the cost-effectiveness of health-promotive self-care and reduction of utilisation of medical services could significantly reduce healthcare expenditure. As self-care ideologies vary among health systems, further economic studies that include using quality-adjusted life-years, disability-adjusted life-years and economic modelling techniques would help improve understanding of the cost-effectiveness of such interventions. Given the mixed evidence in single versus multicomponent approaches and in general population studies compared with targeted subgroups, special consideration should be given to the methods employed in delivering health-promotive self-care information and to the demographic backgrounds of the target users. This review is a stepping stone to exploring the different aspects involved in designing and implementing self-care interventions for healthy populations. It also supports a call to action for public health and academic personnel to recognise the gaps and inconsistencies in the existing forms of self-care and the ideologies that govern it, in order to make well-informed decisions in health promotion.

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