

What impact do chronic disease self-management support interventions have on health inequity gaps related to socioeconomic status: A Systematic Review

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Research article

Keywords: Self-management, socioeconomic status, health inequity, patient capacity, chronic disease

Posted Date: September 19th, 2019

DOI: <https://doi.org/10.21203/rs.2.14593/v1>

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Version of Record: A version of this preprint was published on February 27th, 2020. See the published version at <https://doi.org/10.1186/s12913-020-5010-4>.

Abstract

Background: The social gradient in chronic disease (CD) is well-documented, and the ability to effectively self-manage is crucial to reducing morbidity and mortality from CD. This systematic review aimed to assess the moderating effect of socioeconomic status on self-management support (SMS) interventions in relation to participation, retention and post-intervention outcomes.

Methods: Six databases were searched for studies of any design published until December 2018. Eligible studies reported on outcomes from SMS interventions for adults with chronic disease living in industrialised countries, where socioeconomic status was recorded and a between-groups comparison on SES was made. Possible outcomes were participation rates, retention rates and clinical or behavioural post-intervention results.

Results: Nineteen studies were retrieved, including five studies on participation, five on attrition and nine studies reporting on outcomes following SMS intervention. All participation studies reported reduced engagement in low SES cohorts. Studies assessing retention and post-intervention outcomes had variable results, related to the diversity of interventions. A reduction in health disparity was seen in longer interventions that were individually tailored. Most studies did not provide a theoretical justification for the intervention being investigated, although four studies referred to Bandura's concept of self-efficacy.

Conclusions: The limited research suggests that socioeconomic status does moderate the efficacy of SMS interventions, such that without careful tailoring and direct targeting of barriers to self-management, SMS may exacerbate the social gradient in chronic disease outcomes. Screening for patient disadvantage or workload, rather than simply recording SES, may increase the chances of tailored interventions being directed to those most likely to benefit from them. Future interventions for low SES populations should consider focussing more on treatment burden and patient capacity. Trial registration: PROSPERO registration CRD42019124760 Keywords: Self-management, socioeconomic status, health inequity, patient capacity, chronic disease

Background

Chronic health conditions are increasingly common, with some population groups, such as those of lower socioeconomic status (SES) having both a greater incidence of chronic disease and a poorer prognosis (1–3). Behaviour change or self-management support (SMS) interventions (4, 5) are widely used in chronic condition management, although findings on efficacy have been mixed (6, 7). Low SES populations are known to have poorer outcomes and lower levels of adherence to SMS interventions despite their greater need (8, 9). Tailored SMS approaches for these groups have been trialled, but systematic reviews have shown inconsistent and dose-dependent benefits (9, 10).

Effective public health management of chronic disease (CD) requires both an improvement in overall population health and a reduction in health inequities (11–13). Whole-of-population interventions can widen the disparity gap, especially initially, since the least disadvantaged are likely to have the best

access and take-up (11, 14). Interventions which target disadvantaged groups may result in positive outcomes for that group, but still not address disparity (13). There are strong suggestions that individually-focussed 'downstream' interventions, such as SMS, may actually increase disparity (12, 15, 16), therefore understanding whether such interventions influence health inequity is an important area of research.

Studies exploring disparity require comparisons between different population groups and despite calls from many researchers (13, 15–18), this is rarely undertaken (19). This is partly due to statistical challenges, since the evidence will be found in non-randomised studies and subgroup analyses (15, 20, 21). However, given that the relationship between the social determinants of health and health outcomes is well-established, subgroup analyses need not be post-hoc data dredging but can be planned and plausible approaches to answering these questions (19, 22, 23)

Much attention has been paid to developing SM skills for those suffering from chronic conditions, but there is a risk it may be increasing disparity. This review aims to examine studies that have looked at differences between socioeconomic groups undergoing SMS interventions, in order to answer the following questions: 1. Is there evidence that SES influences participation rates in SMS interventions? 2. Is there evidence that SES influences rates of retention or dropout from SMS interventions? 3: Is there evidence that SES affects clinical, behavioural or other specified outcomes following SMS interventions?

Methods

Search strategy and data abstraction

We conducted a systematic review of the literature using the PRISMA reporting guidelines (24) to structure the report. We searched for full-text articles in English to December 2018 in the following databases: Cochrane database; PubMed; Cinahl; Embase; Proquest and Psycinfo. The search terms covered the following areas, using MeSH terms and synonyms: (1) Chronic condition, including diabetes, cardiovascular disease, musculoskeletal conditions and chronic pulmonary disease; (2) Self-management; (3) Socio-economic status, including associated terms such as inequity, disparity, 'vulnerable groups'; and (4) Terms related to outcomes, efficacy, retention or participation. The PubMed search strategy is available in a supplementary file. No date filter was employed in order to obtain the widest possible search. In the course of the search thirteen related systematic reviews were located and their references were screened resulting in seven additional papers.

Inclusion criteria

Inclusion and exclusion criteria are outlined in Table 1. The search was limited to industrialised countries, since issues of self-management and SES may differ in less-resourced, low-middle income countries (8). A decision was made to focus only on socio-economic status (SES), which has well-documented and consistent effects on chronic disease, rather than on other WHO PROGRESS+ factors such as gender and ethnicity, which can vary between countries (16). We looked for four main chronic conditions:

cardiovascular disease (CVD), musculoskeletal conditions (MSK), pulmonary disease (COPD) and diabetes. All these conditions contribute significantly to the burden of disease and share many common risk factors. We included studies of co/multimorbidity since this is representative of the CD population. All studies needed to provide a comparison between a less and more advantaged group, based on income, education or socioeconomic area. Comparisons based on literacy or ethnicity were only included if there was a quantifiable relationship between these variables and other SES measures. As well as post-intervention outcomes such as behavioural or clinical changes, outcomes related to participation and dropout were included to fully capture potential areas of disparity. Study designs could include randomised controlled trials with subgroup analyses, pre-post designs, cross-sectional or longitudinal data analyses.

Search outcomes

Title and abstract screening reduced the number of papers to 303. Articles were excluded according to the criteria outlined in table 1. Common reasons for exclusion were no SMS intervention (e.g. studies of self-care or adherence behaviours); SES not quantified, and no measurement of SES disparity. A full list of reasons for exclusion of the 284 full-text articles is available in the appendix. Table 2 illustrates the search process undertaken. One reviewer (RH) completed the initial search and a second reviewer (ES) independently assessed the final papers to ensure agreement on inclusion criteria. Nineteen studies were included in the review.

Data abstraction

The data was summarised on the setting, study design, type of CD, sample size, description of intervention and control, outcomes or variables measured, follow-up time and results (Table 3). Table 4 summarises data related specifically to SES and disparity, including the theory behind the SM intervention (or study question for participation/attrition studies), intervention description, SES adaptations made, SES status of population, results in relation to SES, dropout rates and overall impact on SES disparity. Related papers were retrieved to provide additional data about the population or intervention as needed (25–32).

Quality analysis was undertaken using the Joanna Briggs Institute checklists (33) for randomised controlled trials (RCTs) and observational studies, and the Sun/Oxman criteria (22, 23) for subgroup analyses.

Data synthesis

No meta-analysis was possible due to the diversity of study designs, interventions and outcome variables.

Results

Key study characteristics

Nineteen studies were identified, all published in English. Five studies looked at participation in SMS; five studied attrition from SMS programmes and nine assessed outcomes from SMS interventions. Interventions were very diverse, ranging from studies of the group-based Stanford Chronic Disease Self-Management Programme (CDSMP—4 studies) to highly tailored 1–1 interventions. Table 3 details the main features of all studies.

Methodological quality

Most studies were of moderate to good quality although two RCTs (34, 35) and three subgroup analyses (34–36) rated poorly. A table describing the quality rating for each study is available in the appendix.

Impact of SES on participation in SMS interventions

Four cross-sectional studies and one cohort study looked at initial participation in SMS programmes. All were large population surveys ranging from 2,600 to 80,000 people. There were three reports on diabetes SMS education programmes (37–39), one on the Stanford CDSMP (40) and the final study examined recruitment to an internet diabetes SMS programme (41). In all studies, low SES (as measured by education, income or location) was significantly and consistently associated with lower levels of participation, suggesting that disparity in CDSM starts here. Some studies (38, 40) suggested that this imbalance was related to course availability, cost or marketing strategies. However, the studies which did match attendance to course availability and cost (37, 39) found that this did not influence participation in the low SES population. Glasgow (41) also compared participation rates in a self-selected (via media advertising) population to a referred population and found even greater disparity. As well as being of higher SES, the self-selected participants were those at lowest risk and least in need of the intervention.

Impact of SES on retention and dropout from SMS interventions.

Five studies examined attrition: two cross-sectional studies and three RCTs with subgroup analysis, with sample sizes from 100–300. Two RCTs (36, 42) were of more advantaged populations. Of these, one reported low (22.8%) completion rates of the Stanford CDSMP (36), but predictors were related to poor physical health rather than SES. Since this was a high-risk multimorbid rather than a low SES population, dropout likely reflects increased treatment burden, as noted in other multimorbid populations (43). The second study (42), of a diverse urban population, reported no difference in use of a supported internet programme in terms of SES (education). This intervention had been carefully tailored to maximise engagement across population groups and included extensive community involvement in the design process. Three studies (44–46) focussed on low SES populations. Two cross-sectional studies (44, 45) reported that dropout rates correlated to social stressors and lack of job flexibility, suggesting that attrition within a low SES population may be influenced by socioeconomic factors that are not captured by education or income alone. Finally, a small RCT (46) of a tailored group programme found that high levels of dropout were significantly associated with low income and education. By contrast, Horrell et al (40) noted that although SES area predicted enrolment in the Stanford CDSMP, it did not affect rates of completion.

Impact of SES on outcomes following self-management interventions

Nine studies looked at outcomes following SMS interventions, with four describing group interventions (including 2 of the Stanford CDSMP) and five individual (1–1) interventions. Only two of the RCTs (47, 48) were sufficiently powered for subgroup analysis and most had follow-up periods of six months or less.

Two studies reported increased disparity by SES following the intervention. One study was of lower quality (34), but the other (49), a nurse-led 1–1 intervention designed to increase self-efficacy, found that only the higher educated benefited, with no change and an increased dropout rate amongst the lower educated.

Two studies (one of an intensive group intervention, one of a peer support programme) showed no change in disparity of outcomes, with both subgroups benefitting equally. The group intervention (50) was a cohort study of an already advantaged group, and its definition of 'low educated' was quite different from the populations described in many of the other studies. Its relevance to a lower SES population may be limited. The peer support programme (51) (which was designed for a low SES group) reported a clinically significant reduction in HbA1c level in the intervention group across all education levels, with the greatest benefit experienced by those with poorer medication adherence and self-management ability.

Five studies reported increased benefit in a lower SES cohort, suggesting that these interventions may successfully reduce disparities. Of these studies, three (all group interventions with no specific tailoring for low SES) showed minimally significant change both in terms of disparity and overall efficacy. Two studies looked at the CDSMP. One lower-quality study with unreliable subgroup analysis (35) showed slight benefit in a single outcome in the less-educated group, but no overall gains across multiple outcomes. The second study (52) was of higher quality and focussed on a low SES population. Although the CDSMP provided only short-term benefits (no overall gains at 6 or 12 months), the lower educated patients benefited more than higher educated patients in terms of cardiac quality of life (QOL) ($p = 0.018$) over a 12-month period. However, it was not clear whether these gains reached clinical significance. The third group programme (48) used an active education control and found that a SMS group provided no additional benefits. Low-income participants receiving the intervention did have a longer time to cardiac event (death or hospitalisation), but this was not statistically significant.

The remaining two studies (47, 53) were conducted by the same research group, although with different CDs and interventions. Both were high-quality studies of tailored individual low-SES interventions over a long duration (1 year) and both reported statistically and clinically significant benefits. Both studies looked at literacy levels and found that this was a stronger predictor than income or education, with low-literacy patients benefiting more from an intensive intervention than their higher literacy counterparts.

Discussion

Main findings

This systematic review of disparities related to SMS interventions has reinforced observations (13, 15–17, 21) that there is a lack of research in this area. There are practical and statistical challenges in comparing population subgroups. Many studies had SES groupings that were fairly homogenous, limiting the ability to compare outcomes within the analysis, and almost all subgroup analyses were insufficiently powered. Larger studies, and co-operation between different study populations are needed. Despite these limitations, the evidence does support a significant and consistent impact of SES on participation in SMS interventions. The findings on retention, dropout and outcomes were mixed, and suggested a more complex picture where SES interacts with the patient's other capacities and demands.

Effect of SES on participation

This review confirms that low SES groups are significantly less likely to participate in SMS interventions (37–41). Thus, healthcare disparity is increasing before an intervention even commences. In order to reach those who need the intervention, targeted recruitment and retention strategies will be needed. Self-selection runs the risk of spending limited resources on those who need them least (41).

Effect of SES on retention and dropout

The findings in relation to retention and dropout are less clear-cut, with few studies and small sample sizes. Social factors do appear to be important (44–46), although a simple measure of SES may not capture the barriers to engagement.

Effect of SES on outcomes

Effects on disparity were mixed. No trends were observed in terms of the SM components, which varied little between studies, or the type of service providers involved. Programme structure (group or individual) did seem to affect both dropout rates and outcomes, with fewer benefits observed in group interventions. In contrast, the two high-quality studies which reported a reduction in disparity as well as statistical and clinical benefits overall were tailored individual interventions (28, 47). In the few programmes that recorded dropout by SES, it appeared that attrition was also greater from group programmes (see Table 4). High rates of dropout from group programmes have been reported in several reviews of CD interventions in low SES and other vulnerable groups (10, 54) while other reviews (9, 55, 56) have noted that individually tailored interventions appear to reduce disparity. Other authors have noted that although group programmes provide beneficial social support and peer modelling (4), they can also present many barriers to a low SES population who may have less flexibility in terms of work, transport or caring demands (10, 54). In the current review, interventions over longer time periods (6–12 months) also seemed to be more effective at reducing disparity (47, 51, 53), consistent with a CD review on similar populations (9).

Interpretation of findings

This review suggests that SMS interventions may impact differently on low SES populations, and that more individualised treatment over longer time periods may be needed. Some writers have suggested that SES could be used as a 'high risk' predictor to identify those needing an earlier or more intensive intervention (18, 57), although this encompasses a large population group and has significant resource implications, emphasising the need for appropriate targeting of interventions.

Data from the current review indicates that low SES groups are heterogeneous, with additional factors such as literacy, social stressors and social capital influencing SM ability, engagement, health outcomes (44, 45, 47, 53) and thus disparity. Therefore, some low SES groups may benefit simply from better marketing of and access to generic SM courses (40) and lower-level interventions, while others will require a more intensive, tailored approach. The ability to accurately identify these groups, perhaps by using a triage instrument, could lead to more effective resource allocation, increased participation and better outcomes in terms of both efficacy and equity.

Of those studies reviewed, few explained the theory or mechanism behind the proposed SMS intervention. This has been observed in other reviews of SMS (8, 58). Several papers referred to increasing self-efficacy and patient responsibility as a way of improving SM ability (35, 48, 49, 52), which is the basis for the Stanford CDSMP and similar programmes (4). The studies which targeted a low SES population did note particular challenges for disadvantaged groups in terms of knowledge or literacy (47, 51, 53). However, despite the extensive body of research into barriers to SM, there was little consideration of how an SMS intervention might need to work differently in the low SES population. Multiple reviews have consistently reported that beliefs (especially control beliefs, reflected in self-efficacy) (7, 59, 60); health provider/system issues (60, 61); resources (literacy, financial, job/carer demands) (60, 62–64); and condition demands (multimorbidity, treatment burden) (43, 64, 65) are the principal barriers to self-management. Reflecting on each of these elements in turn and their relation to SES may suggest alternative, theory-driven approaches to reduce disparity.

Many of the studies in this review aimed to increase self-efficacy (35, 48, 49, 52) in order to improve self-management ability. In vulnerable groups this relationship is more modest (66), indicating that other factors such as resources or access may need addressing. Furthermore, since the development of self-efficacy depends both on one's behaviour and on social/environmental feedback (67), several authors (49, 68) have suggested that it may be difficult to increase self-efficacy when environmental feedback (e.g. job or housing insecurity) negates a belief in control over one's circumstances. Modifying a SMS programme for 'low SES' simply by making literacy or language adaptations cannot address this inherent contradiction between belief and reality. Thus, interventions based solely on self-efficacy theory (which emphasises building individual capacity without addressing environmental constraints) may be less useful in disadvantaged populations (68) and potentially lead to increased disparity. A social contextual model of health behaviour change (67) may provide a more appropriate theoretical basis for interventions in this population. In the current review, the studies with better results in terms of disparities did have mechanisms to address the social context, such as tailored assistance to identify and solve practical barriers (47, 51, 53).

Apart from self-efficacy beliefs, other factors identified as barriers to SM are rarely addressed in interventions. Health provider/system issues can create challenges for low SES groups due to costs, lower literacy and a lack of understanding of the social determinants of health by providers (60, 61). Although few studies of SM in disadvantaged populations look at interventions at the health provider/system level (10, 13), it would seem a potentially effective way to reduce disparity without increasing the patient's treatment burden.

Barriers to SM that are related to resources and condition demands impact disproportionately on the low SES population (69–71). They have fewer financial and social resources; experience higher levels of overall social complexity related to job/housing insecurity, family demands and early life trauma (3); and have increased rates of multimorbidity at earlier ages (72). Both their disease-related workload (treatment burden) and their non-disease workload (life burden) (69, 73) will be higher. Unfortunately, many behaviour change interventions, especially those requiring regular attendances or homework, actually increase workload. Approaches that reduce patient workload or increase access to resources are rarely tried, but are likely to be important in low SES groups (69). Phone consultations, problem-solving of specific barriers, integrating healthcare with social services and directing interventions toward healthcare practitioners rather than individual patients are all likely to reduce treatment burden and maximise resources. Coventry (72), in a qualitative study of SM and multimorbidity, identifies three factors required for engagement in SM: capacity (resources, knowledge and energy); responsibility (shared understanding between the patient and provider about how to manage the treatment workload) and motivation. All three are negatively impacted by low SES, yet many SMS interventions (74) aim to increase motivation without recognising responsibility or capacity, and thus may contribute to increasing disparity in low SES groups.

Strengths And Limitations

This review does identify important gaps in knowledge and potential directions for future research. It also reveals the assumptions informing SMS approaches and the inadequacy of using 'low SES' to define a population group. The study limitations include the lack of published research on disparity in SM interventions. It was difficult to conduct a comprehensive literature search of this topic because many subgroup analyses were a relatively small part of the overall paper. It is possible that some studies were missed that may have provided useful data. Meta-analysis was not possible due to the variety of studies available; therefore, no strong conclusions can be formed. In addition, the methodology of many of the studies prohibited causal inference: several studies were cross-sectional and most subgroup analyses were underpowered or did not formulate a priori hypotheses.

Conclusion

This review has identified several important themes in relation to self-management and socioeconomic disparity. First and most obviously, there is a great need for equity considerations to be included in CD studies, as advocated by Cochrane reviewers (17, 21). Given the strength of evidence available about social determinants of health, it should be possible to establish a priori hypotheses and sample sizes

sufficient for subgroup analysis (including the availability of relevant comparator groups) for many interventions.

Secondly, any intervention in a low SES or otherwise disadvantaged group should consider its theoretical basis. Social-contextual approaches, rather than individualised self-efficacy focussed approaches, may be more effective. Paying greater attention to the large and consistent body of qualitative studies on barriers to SM can provide both theoretical and practical guidance as to interventions that can address disparity. Approaches such as the Cumulative Complexity Model (73) have much to offer.

Finally, levels of disadvantage vary, and there is a need for risk identification within the low SES population. For many people, improving access to simple SM interventions (e.g. assistance with childcare or transport, free programmes at community locations) may be all that is needed. For others—especially those with multimorbidity, poor literacy or social complexity—an individually tailored approach will be needed to be effective. Research to develop a risk assessment system may ensure that those most in need receive the greatest support as opposed to the current situation.

Abbreviations

SES: socioeconomic status; SMS: self-management support; SM: self-management; CD: chronic disease; CVD: cardiovascular disease; MSK: musculoskeletal; COPD: chronic obstructive pulmonary disease; RCTs: randomised controlled trials; CDSMP: chronic disease self-management programme; DSME: diabetes self-management education.

Declarations

Ethics approval and consent to participate: Not applicable

Consent for publication: Not applicable

Availability of data and material: Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.

Competing interests: The authors declare that they have no competing interests.

Funding: No funding was received for this study.

Authors' contributions: RH conducted the initial search with assistance from ES. RH drafted the initial manuscript, and ES and SB edited and further developed the manuscript. All authors read and approved the final manuscript.

Acknowledgements: Thanks to Ms Nadia Wesolek, Sunraysia Community Health Services; and Dr Kelly Naess, Sunraysia Community Health Services, for feedback on the manuscript. Thanks to Ms

Elizabeth Lawrence, La Trobe University, for assistance with the systematic search strategy.

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