

Exploring Associations between Social Support and Mental Health in Older People: A systematic Narrative Review

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Abstract. The association between social support and mental health is still not fully understood, especially among older people. The purpose of this review is to summarize the current state of research on the topic. The authors undertook a systematic review to identify all review studies irrespective of date, and new primary research studies published since 2007 that examined the associations between social support and mental health among older people. Overall, 24 citations (6 review and 18 original articles) met the inclusion criteria. The results for the 'main effect' model and the 'stress-buffering effect' model of the action of social support on health were summarised. Overall, the review studies provided moderate evidence that social support has a protective effect on mental health. Results from primary research studies lend some support to the hypothesis of a protective main effect of support, but are far from conclusive. There was weak evidence for a stress buffering effect on the mental health. Stronger evidence was found for the association of emotional support than instrumental support with depression. Although diversity in the characteristics of the studies included, in addition to methodological limitations, makes the estimation of the effects of social support on health complicated, overall at least a moderate importance of social support for mental health of older people was demonstrated. This review indicates areas which need further investigation, such as studies focusing on older people, across non-western countries, studies with prospective research design, and investigation on the role of gender and support providers, using more comprehensive instruments.

Keywords: social support, mental health, older people, systematic review

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Introduction

Social support has been conceptualised in a range of different ways. In a basic definition it is defined as resources provided by other persons (Cohen & Syme, 1985) to be intended to enhance the wellbeing of the recipient (Shumaker & Brownell, 1984). Social support includes two dimensions, perceived and received. 'Perceived social support' is a subjective feeling of being supported, whereas 'received social support' refers to indicators of what people receive from others (Tardy, 1985). In addition to its different dimensions, social support has also been conceptualised to have 'structural' and 'functional' aspects. The functional aspect refers to the type or content of support, while the structural aspect is the actual physicality of the support and includes quantitative elements such as size of social network (Cobb, 1976).

Research interest in social support began in the 1970s (Bowling, 1994), grew until 1990s and gradually decreased since then (Callaghan & Morrissey, 1993). The interest in social support and health research was triggered by a number of influential review papers published in the mid-1970s (Kaplan, Cassel & Gore, 1977; Cassel, 1976 and 1974; Cobb, 1976). These review papers generated a great deal of scientific interest in the possibility that interpersonal relationships might protect health. Two main models of the action of social support on health have been hypothesised, the 'main effect' model and the 'stress-buffering effect' model. The main (or direct) effect model implies that social support has a positive effect on health and operates at all the times, irrespective of the individual's exposure to a stress (House, Umberson, & Landis, 1988; Berkman & Syme, 1979). Alternatively, the stress-buffering model proposes that the buffering effect of social support occurs only when the person is exposed to a stressful situation, and in the absence of stress, social support is not linked to health (Taylor, 1995). Evidence exists to support both models, but is also contradictory.

The concept of social support was first used in the mental, rather than physical, health literature and in social support research there has always been a strong emphasis and focus on mental health (House et al., 1988). This is because social support is believed to play an important role in moderating the effects of stress, particularly on mental health (Cooper et al., 1999). Mental health has also been conceptualised variously with positive or negative perspectives. In the positive perspective, mental health is conceptualized as a matter of wellbeing, while in the negative perspective, it implies mental disorders, symptoms, and problems (World Health Organization, 2005). Research has focused more on negative rather than positive measures of mental health, mainly because it is easier to measure mental disorders or symptoms, rather than characteristics of a good mental health (ibid., 2001).

A brief review revealed that most of the available evidence reported a significant association between lack of social support and poorer mental health. However, most studies were cross-sectional and concerns were expressed about the direction of the association between social support and mental health (House et al., 1988). For example, people who are depressed may perceive and report inadequate support despite receiving a high level of support (Berkman, 1984). Even in the existing longitudinal studies (e.g. Bums & Farina, 1984; Henderson, 1981) and experimental studies (Broadhead et al., 1983; Levy, 1983; Mumford, Schlesinger & Glass,

1982; DiMatteo & Hays, 1981) causal interpretation is to some degree uncertain mostly because of methodological limitations of these studies. Therefore, the association between social support and mental health is still not fully understood.

The association is even less understood among older people and no review study so far specifically focused on older people. This is while, social support is of particular importance for older people due to increasing various age associated stressors such as increased risk of chronic diseases (McLeod & Kessler, 1990; Oxman, Berkman, Kasl, Freeman and Barrett, 1992). On the other hand, sources of social support may diminish in later life as a result of widowhood, mobility of kin and loss of sources of income (Gottlieb, 1983; Broadhead et al., 1983). Therefore, understanding the effects of poor social support on mental health of older people is especially important.

Additionally, in the social support and mental health literature a number of issues remain unclear. There is inconsistency between different reviews in the magnitude of the main and stress buffering associations and differences on the importance of various dimensions and aspects of social support on mental health, in particular the moderating role of gender and providers of support in the associations has received less attention. To address these issues, we conducted a systematic literature review on quantitative research studies which have explored associations between social support and mental health in older people.

Design of the systematic review

Criteria for considering studies for this review

Two types of studies on the associations between social support and mental health were included, review studies irrespective of date and primary research studies published since 2007. Although ideally it might have been desirable to include all primary studies, regardless of date of publication, a preliminary online search using the key search terms 'social support' and 'mental health' in older people identified over 400,000 references so this was clearly not practicable. Moreover, knowledge gained from these earlier studies is included indirectly in this review both through the inclusion of key review articles and because more recent studies have been informed in design and conceptualisation by the earlier literature.

Review articles were not restricted to systematic reviews. Reviews that focused exclusively on children or young people (Chu, Saucier & Hafner, 2010) were excluded. In the review of primary research studies, all quantitative studies investigating the associations between any type of social support and mental health in older people aged 60 or over conducted in the five years (2007-2012) were included. However, studies that investigated outcome measures such as stress (Viswesvaran, Sanchez & Fisher, 1999), or loneliness (Golden et al., 2009b) were excluded, although they were related to mental health in some ways. In both types of publications, studies which measured both social support and mental health but did not examine the associations between them were excluded. Studies focussed on 'Social Networks' (Macêdo Corrêa, Moreira-Almeida, Menezes, Vallada, & Scazufca, 2011; Golden,

Conroyb & Lawlor, 2009a), rather than social support were also excluded. However, as previous research has sometimes used these concepts interchangeably, to avoid missing the social support studies, we initially included both terms and then read the abstracts (or full-text) of all papers before excluding those that dealt only with social networks. The search was limited to English language papers. No geographic limitation was given. Studies were not excluded on grounds of methodological quality.

Search strategy

Twenty-one electronic databases, as listed below, were searched to identify studies that met the inclusion criteria of this review. The selection of databases and websites was made based on their relevance to our research area.

Table 1: Electronic databases researched

1. Age Info
2. CAB Abstracts (Ovid SP) (1973 to present)
3. Centre for Review and Dissemination (CRD)
4. Cochrane Collection databases (1993 to present)
5. Dissertations & Theses (N. American PhD theses) (1637 to present)
6. Eldis
7. EMBASE (Ovid SP) (1947 to present)
8. EThoS (UK theses)
9. FRANCIS (1984 to present)
10. Global Health (Ovid SP) (1910 to present)
11. IMEMR
12. Index to Theses of the British Isles (1716 to present)
13. International bibliography of the social sciences (IBSS) (1951 to present)
14. ISI Web of Science (Journal Citation Reports) (1970 to present)
15. JSTOR
16. Medline (Ovid SP) (1946 to present)
17. PsycARTICLES (EBSCOhost) (1894 to present)
18. PsycEXTRA (EBSCOhost) (1908 to present)
19. PsycINFO (1806 to present)
20. PubMed (EBSCOhost) (1950 to present)
21. Social Policy & Practice (social policy) (Ovid SP) (1890 to present)

Table 2: Terms or phrases mainly used in most of the databases

<p><i>"Social Support"[Mesh] OR social [Title/Abstract] AND support*[Title/Abstract] OR social [Title/Abstract] AND network*[Title/Abstract]</i></p> <p><i>AND</i></p> <p><i>"Mental Health"[Mesh] OR "Mental Disorders"[Mesh] OR psych*[Title/Abstract] OR depression*[Title/Abstract] OR anxiety*[Title/Abstract]</i></p>

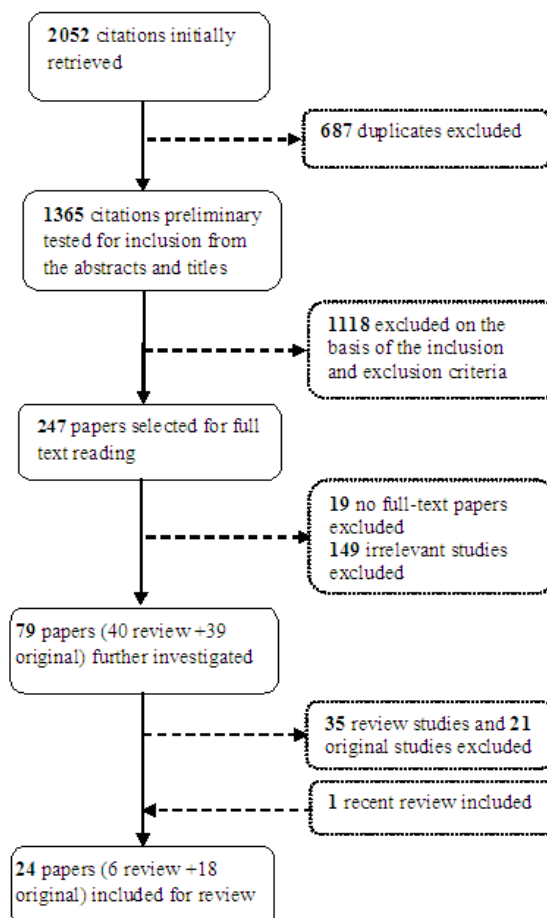
Articles were identified by searching keywords, abstracts and titles in the electronic databases and selected websites. When the titles and abstracts were not sufficient to determine if the inclusion criteria were met, the full-text of the papers was obtained and read. In most of the databases limiting the search by publication type was possible. These were then searched twice, once to find review articles for all years and then to find individual original articles published since 2007.

In addition to electronic searching, a number of highly relevant journals were hand searched to insure as many relevant studies were included as possible. Additionally, the bibliographies of the included studies, electronically or by hand, were also searched. We scanned the reference lists of all included papers to identify the main contributing authors to this topic. A further search was then made using the name of these authors in order to ensure that the most relevant studies were included in the review.

Article identification and selection process

The process of article identification and selection of papers is shown in Figure 1. Using different search methods and after applying the study criteria eventually, 24 citations (six review and 18 original articles) were included.

Figure 1: Article identification and selection process



We extracted the required data from the included review and original articles using a purposefully designed data extraction form. The studies included were developed for a diversity of objectives, used a variety of measures and methods and included study participants with different characteristics. This diversity made formal meta-analysis impossible. Therefore, the results of similar dimensions or aspects of social support were identified and grouped together and then the findings were reported, compared and examined descriptively.

Results of the systematic review

Findings from review articles

Although only six review studies were included in our review (Letvak, 2002; Wang, Wu & Liu, 2003; Wang, 1998; Salter, Foley & Teasell, 2010; Prati & Pietrantonio, 2010; Tajvar, Fletcher, Grundy & Arab, 2013), as each review summarised the results of many studies thus their results are very valuable. Among the review articles, all apart from one (Letvak, 2002), were conducted systematically, of which three were meta-analytic review studies. Of these articles only the study of Salter et al. (2010) comprised a review of studies exclusively relating to older people, but included only those who had a stroke. Most of the review studies were fairly recent, conducted in the last 10 years. The number of primary studies included in these reviews ranged from only four in the study of Letvak (2002) to 75 in the study of Wang et al. (2003). Overall, 156 studies were included in six review papers, of which 100 studies examined only the main effect model, 11 studies examined the stress-buffering effect model and the remaining 45 studies did not specifically provide information on this.

Of 100 studies examining the main effect of social support, four studies found a significant association between social support and mental health (Letvak, 2002), but the individual results of 96 other studies were not reported. Instead, it was reported that the pooled effect size (ES) of social support in those studies were significantly correlated with all the mental health outcomes. However, it was also reported that the ES of social support on depression was medium in 75 of 96 studies (Wang et al., 2003) and small in 21 studies (Wang, 1998). The ES of social support on coping behaviour and positive mood state was reported to be medium and the ES of social support on psychological symptoms and responses, psychosocial adjustment, negative mood state and stress was reported as small.

Of the other 45 studies in which it was not clear whether stress buffering or main effects were considered, eight studies reported a significant association between social support and mental health measures and the ES in 37 studies (Prati & Pietrantonio, 2010) was reported as to be medium. Moreover, both studies (Tajvar et al., 2013; Prati & Pietrantonio, 2010) that reported on the associations between dimensions of social support and mental health indicated a stronger association with perceived social support than received social support and depression. Of 11 studies examining the stress-buffering effect model, only two (Claiborne, 2006; Koopman et al., 2001) found a significant buffering effect of social support on the association between a stressor and depression. In summary, although most of the

studies reported that social support has a significant main association with mental health, ESs in most of them were of medium or small magnitude (as reported by the reviewers). There is less evidence to support the stress-buffering effect of social support. It should also be noted that most of the studies included were cross-sectional. Nevertheless, most of the review papers concluded that interventions aimed at increasing social support among individuals might promote their mental health. However, Salter et al.'s (2010) review of intervention studies found that only 1 of the 10 randomized controlled trials included found a significant, positive effect of the social support intervention on depression. Overall, this overview of review studies provides moderate evidence to support the notion that social support has a protective effect on mental health.

Findings from primary research articles

All of the 18 studies examined the main effect model, and eight studies also examined the stress-buffering effect model of social support. The characteristics of these studies are summarised in Table 1.

Table 1: Summary of primary research studies included in the present systematic review

Ref., Setting, Main Objective	N	Sample, Sampling	Design and Methods	Measures of SS and MH	Key Findings
Alexandrino-Silva et al. (2011) Brazil M <i>To examine the association of life events and SS in depression in late life.</i>	367	Household community sample of older people 60+, 65% female Over sampling people over 60 in a sampling frame of people 18+	XS Regression analysis	MH measure: 'Old age symptomatic depression' measured by CIDI 1.1 (RVT) SS measure: PSS measured by Assessment and Referral Evaluation (SHORT-CARE) inventory	Depression was associated with a perceived lack of SS in men (OR=3.5, 95%CI= 1.1-12.1, P=0.04) but not in women (OR=0.7, 95%CI= 0.4-1.4, P=0.29). Thus, gender differences should be considered.
Nemeroff et al. (2010) USA M/B <i>To investigate the relative influence of SS and perceived control on the psychological distress under stressful life circumstances</i>	134	Community-dwelling older people aged 65+, 64% female Convenient sampling	XS Regression analysis	MH measure: BSI to detect psychological distress (RVT) SS measure: PSS measured by SSQSR (RVT)	In testing the main effects model, only SS but not stress (measured by Elders Life Stress Inventory) was found to be a significant predictor of psychological distress; Greater satisfaction with SS was associated with lower levels of psychological distress (p< 0.001). The interaction of stress × SS had a non-significant relationship with psychological distress (p>0.05)
Bierman & Statland (2010) USA M/B <i>To examine how SS resources and the timing of limitations intersect to shape the relationship between ADL limitations and changes in psychological distress</i>	1167	Community residents older people aged 65+ in wave 1 of the ASH study and 925 people (79% retention rate) after 2 years Random sampling RR=65%	Longitudinal study over a 2-year period Regression Analysis	MH measure: Depression measured by Hopkins Symptoms Checklist (Derogatis, et al., 1974) (RVT) SS measure: PSS measured by a 4-item scale adapted from Schieman (2005) (RVT)	Neither the main effect model, nor the buffering model of SS was significant; While, greater limitations in ADLs were positively related to changes in depressive symptoms over the course of the study, PSS was not significant (OR=0.003, p>0.05). Also, PSS did not interact in the relationship between ADL limitations and depressive symptoms (OR=0.047, p>0.05).

Ref., Setting, Main Objective	N	Sample, Sampling	Design and Methods	Measures of SS and MH	Key Findings
Lee & Dunkle (2010) South Korea M/B <i>To investigate how worries and psychosocial distress are related to depressive symptoms</i>	193	Community-dwelling oldest old 85+ years old, 71% female	XS Hierarchical regression analysis	MH measure: Depression measured by 15-item version of GDS-SF (RVT) SS measure: Self developed 8-item questionnaire (4 items for received emotional SS and 4 items for received instrumental SS (RVT))	There was a strong correlation between worries and depressive symptoms. Both emotional support and instrumental support received from adult children had main effects on depressive symptoms. However, only emotional support from adult children had a powerful buffering effect on the relationship between worries and depressive symptoms.
Olutoyin Oni (2010) Canada M <i>To determine how specific types of informal social relationships affect the health of the elderly</i>	54	Older people aged 65+ in nursing homes, 70% women convenience sampling RR=87%	XS Regression analysis	MH measure: Depression measured by 15-item GDS (RVT) SS measure: Duke SS Scale (including 2 subscales; PSS from family and PSS from friends) (RVT)	Both support from family (OR= 0.16, p=0.02) and support from friends (OR= 0.09, p=0.01) were significantly associated with depression; however, friend support was a more reliable factor for predicting the levels of depression after controlling for all other covariates.
Jawad et al. (2009) Lebanon M/B <i>To investigate the moderating role of various SS factors in the stress–depression relationship</i>	490	Community-residing older adults in post-civil war Lebanon aged 60+, 58% women	XS Regression analysis	MH measure: Depression measured by GDS-15 (RVT) SS measure: Availability of SS (having spouse and number of co-resident children) and quality of SS	Availability of SS: There was no significant association between presence of a spouse and lower depression (OR= 0.39, p>0.05) but having more children was associated with lower depression (OR= 0.10, p<0.001). Quality of SS: Reported good relationships with others were associated with fewer depression symptoms. The buffering effect of SS depended on the nature of the stressor and the source of SS. But for 'total number of life stresses' SS did not show a buffering role.
Safezadeh (2009) Iran M <i>To identify the associations between characteristics of older people with their mental health</i>	312	Community-resident older people 65+ years old, 55% men Stratified sampling method RR=94%	XS Bivariate analysis	MH measure: GHQ-12 to detect Psychiatric disorders SS measure: A single question asking whether SS is low, median or high	The mean GHQ scores of those with low, median and high SS were 30.8, 31.2 and 33.2 and differences were significant using bivariate analysis. Women, widowed, older, less educated, less income, and those with low class occupation had significantly poorer MH.
Bozo et al. (2009) Turkey M/B <i>To examine the effects of ADL and perceived SS on the level of depression and the moderating role of SS in relations between ADL and depression</i>	102	Older people aged 60+ selected from three cities of Turkey, 67% women Convenient sampling	XS Hierarchical regression analysis	MH measures: Depression measured by BDI-21 (RVT) SS measure: PSS measured by MSPSS from different sources (RVT)	While both higher ADL functioning and higher PSS had significant associations with lower depression (main effect model) (p<0.001), there was no interaction of PSS in the association between ADL impairment and depression (p>0.05), rejecting the stress-buffering theory of SS.

Ref., Setting, Main Objective	N	Sample, Sampling	Design and Methods	Measures of SS and MH	Key Findings
Mechakra-Tahiri et al. (2009) Canada M To assess differences in the associations between social relationships and depression across urban and rural settings.	2670	Community dwelling older persons aged 65+, 60% women Random sampling RR= 66%	XS Regression analysis	MH measure: ESA- Q measuring 9 associated symptoms of depression (RVT) SS measure: Three questions on SS (availability of SS resources, emotional SS and instrumental SS) and overall SS score	There was a significant association between overall SS score of total population and their depression in multivariate logistic regression model (OR=0.64, 95% CI= 0.47-0.88).
Lien et al. (2009) Taiwan M To detect the relationships of uncertainty, SS and psychological adjustment during the period of the surgery	43	Older cancer patients aged 65+ who were undergoing surgery, 93% men Purposive sampling RR=73%	pre-/post descriptive design (longitudinal correlative study 10-14 days) Bivariate analysis (before-after analysis using Pearson correlation)	MH measure: Anxiety and depression measured by Chinese version of HADS (RVT) SS measure: PSS measured by Interpersonal Support Evaluation List (RVT)	There was a positive correlation between anxiety and SS after surgery, so that with increasing SS, anxiety was also increased ($r = 0.30$, $p < 0.05$). There was no significant correlation between SS and depression neither before nor after surgery. Healthcare professionals were the main providers of information; while spouses, family members and friends provided mostly emotional support. Spouse is the main provider of SS in the social network.
Rueda & Artazcoz (2009) Spain M To analyze the social determinants of health in Catalonia, using a combined framework of socio-economic position, family roles and SS.	2597	Older people 65-85 years old of a representative sample of the non-institutionalised population of Catalonia- Spain 57% women Random sampling	XS Hierarchical regression analysis	MH measure: GHQ-12 to detect psychiatric disorders (RVT) SS measure: Reduced version of Duke SS Scale (measuring confidant and affective SS) (RVT)	Confidant SS was negatively associated with poor MH in both sexes (Men: OR=0.92, 95% CI=0.86-0.98, $p < 0.01$, Women: OR=0.95, 95% CI=0.91-0.99, $p < 0.05$), whereas affective SS was only negatively associated with poor MH status of women (Women: OR=0.89, 95% CI=0.83-0.96, $p < 0.01$).
Cruza-Guet et al. (2008) USA M/B To test five theoretical models (including the main and buffering effects of SS) for explanations regarding the efficacy of naturally exchanged SS	273	Community-dwelling Hispanic elders aged 70+ living in a Miami, Florida Neighbourhood, 59% female Random clustering	XS Hierarchical regression analysis	MH measure: A composite score of anxiety and depressive measured by STAI and CES-D respectively (both RVT) SS measure: Frequency of RSS and satisfaction with RSS in the forms of informational tangible and emotional SS (RVT)	In the main-effects model, satisfaction with RSS was associated with lower psychological disorders, whereas frequency of RSS was unexpectedly associated with heightened psychological disorders. Hispanic elders who receive SS in the form of informational SS, despite tangible and emotional support, exhibited higher levels of psychological disorders. Neither frequency of RSS nor did satisfaction with RSS buffer the noxious effects of financial strain on psychological disorders.

Ref., Setting, Main Objective	N	Sample, Sampling	Design and Methods	Measures of SS and MH	Key Findings
Thygesen et al. (2008) Norway M To investigate the influence of risk factors and personal resources on perceived psychological distress	214	Elderly aged 75+ receiving home nursing care in 7 municipalities in southern Norway, 70% female Selected randomly RR=65%	XS Regression analysis	MH measures: GHQ-30 cut off 4+ to detect psychiatric disorders (RVT) SS measure: PSS measured by revised SPS (RVT)	No significant association between SPS and psychological distress was found (OR= 0.006, p>0.05). Of other covariates in the multivariate analysis sense of coherence, education and subjective health complaints were factors that were significantly related to psychological distress
Pasha et al. (2007) Iran M To compare general health and SS of community-resident older people with those of institutionalised older people	100	50 institutionalised (random selection) and 50 community resident older people (convenient sampling) Aged 65+ years, Same proportion of men and women	XS Bivariate analysis	MH measure : GHQ-28 to detect psychiatric disorders (RVT) SS measure: SS Philips Questionnaire (RVT)	SS was correlated with better MH in both community residents and institutionalised people. Community residents reported significantly better MH and higher SS compared to institutionalised people.
Koosheshi (2007) Iran M To investigate the relationship between living arrangements, SS and health of older people	526	Community resident older people 60+ years old	XS Regression Analysis	MH measure: GHQ-12 to detect psychiatric disorders (RVT) SS measure: Received emotional and instrumental SS in the last 1 year, developed by the author	Neither emotional nor instrumental support had direct associations with MH. While older men received SS from their wife more than other sources, the main source of SS for older women was their children
Wong et al. (2007) USA M To examine whether SS is positively related to psychological well-being.	200	Self-identified older Chinese and Koreans aged 65+, 56% women convenience sample RR= 75%	XS Regression analysis	MH measure: Overall psychological well-being measured by MHI-17 (domains: depression, anxiety and positive affect) SS measure: RSS (financial, information/advice, emotional/companionship and language) measured by a self developed 30-item questionnaire (RVT)	Having more emotional/companionship support significantly contributed to better overall psychological well-being less depression and higher positive affect. Those who had less financial support were more likely to be anxious. Language support and information/advice support were not associated with any domain of psychological well-being.
Leung et al. (2007) Taiwan M/B To investigate how SS and family functioning affect MH, and to examine the buffering effects of support in the presence of health stressors.	507	Elderly 65+ years old in industrial city or a rural community in northern Taiwan, 63% male Cluster random	XS Hierarchical regression analysis	MH measure: Depression and anxiety measured by Chinese version of SCL-90-R (RVT) SS measure: PSS (instrumental and emotional) measured by SSRS (RVT)	Instrumental support had neither main effect nor buffering effect on depression and anxiety. Emotional support had significant main effects on both depression and anxiety. However, emotional support modified the stress of cognitive impairment on depression only but not on anxiety.

Ref., Setting, Main Objective	N	Sample, Sampling	Design and Methods	Measures of SS and MH	Key Findings
Han et al. (2007) USA M/B To examine the relationships among acculturative stress, SS, and depression also examining main and buffering effect of SS	205	Elderly Korean aged 60+ immigrants in the Baltimore area, 63% Female Selected randomly from a sampling frame RR=61%	Secondary research of XS Hierarchical regression analysis	MH measure: Depression measured by KDSKA (RVT) SS measure: Structural SS (network size and satisfaction with the support network resources available) and PSS measured by Korean-translated PRQ (part 1 and part 2) (RVT)	Lower PSS were associated with higher depression, whereas network size and satisfaction with support were not. Neither structural SS nor PSS buffer the noxious effects of acculturative stress on depression in the sample of Korean elderly immigrants. Adult children were found to be the main source of support utilized by elders regardless of the type of need, even when the elder had a living spouse. Spouses were the next common source of support.

Abbreviations: Social Support (SS); Mental Health (MH); Main or Buffering Effect (M, M/B); Sample Size (N); Perceived social support(PSS); Received social support(RSS); Reliability and validity tested (RVT); Cross-sectional (XS); General Health Questionnaire (GHQ); Social Provisions Scale (SPS); Personal Resource Questionnaire (PRQ); Composite International Diagnostic Interview 1.1 (CIDI 1.1); Hospital Anxiety and Depression Scale (HADS); Centre for Epidemiological Studies–Depression Scale (CES-D); Spielberger State Trait Anxiety Inventory (STAI); Brief Symptom Inventory (BSI); SS Questionnaire–Short Form (SSQSR); Symptom Checklist 90-R (SCL-90-R); SS Rating Scale (SSRS); Mental Health Inventory (MHI); Geriatric Depression Scale (GDS); Multidimensional Scale of Perceived Social Support (MSPSS); Kim Depression Scale for Korean Americans (KDSKA); Activities of Daily Living (ADL); Beck Depression Inventory (BDI); Ageing, Stress, and Health (ASH) study; Etude de Sante’ des Aine’s study questionnaire (ESA-Q)

Studies included reported on research undertaken in 10 countries. In 12 studies, as expected, women predominated. The participants in 14 studies were household community dwelling older people with no particular diagnosed diseases. Others were older people who were receiving home nursing (n=3) or were living in nursing homes (n=1).

Most studies (n=16) used a cross-sectional methodology and only two studies were conducted longitudinally (Lien, Lin, Kuo & Chen, 2009; Bierman & Statland, 2010). Conceptualisation and measurement of social support and mental health differed in most of the studies. Assessment instruments in many of the studies had poor or unknown validity and reliability, particularly for social support. Another limitation was the small sample size in most studies. This may have had limited statistical power to detect associations, particularly when studies aim to identify interaction effects (Smith & Day, 1984), as did eight studies in this review. In addition, many of the studies had limited external validity, because of using convenience sampling rather than population based random sampling method or exclusion of some groups of the older population such as those with psychiatric disorders. These methodological problems, may limit the validity of the results of the studies reported below.

Main (direct) associations between social support and mental health

Of the 18 studies, 14 examined the association between perceived social support and mental health and six studies examined the association between received social support and mental health. Thus, two studies (Rueda & Artazcoz, 2009; Cruza-Guet, Spokane, Caskie, Brown & Szapocznik, 2008) measured both dimensions. Moreover, two studies (Jawad, Sibai & Chaaya, 2009; Han, Kim, Lee, Pistulka and Kim, 2007) also investigated structural aspects of social support. Because some studies examined the relationship between more than one dimension/aspect of social support and/or more than one measure of mental health there

were in total 40 relevant analyses. Of the 40 analyses, 23, 14 and 3 respectively, examined the associations between perceived, received and structural social support and mental health. Of the types (functions) of social support, emotional support was the most researched type (n=8) and instrumental support was the second popular type measured (n=6); other types were rarely investigated.

The results of the associations between social support and mental health provided below are based on only statistical significance, although it was preferable to report also some quantitative results such as Odds Ratios (OR) and Confidence Intervals (CIs). This is because only a few studies provided these data, or provided these only for significant associations. Nevertheless, where available these data were extracted and added to Table 1.

Of 23 analyses examining perceived social support, 11 showed a significant association (Nemeroff, Midlarsky, Meyer & Source, 2010; Olutoyin Oni, 2010; Jawad et al., 2009; Bozo, Toksabay & Kürüm, 2009; Cruza-Guet et al., 2008; Han et al., 2007; Mechakra-Tahiri, Zunzunegui, Préville & Dubé, 2009), and nine a non-significant association (Bierman & Statland, 2010; Thygesen, Saevareida, Lindstromb & Engedal, 2008). Additionally, one analysis was significant for women only (Rueda & Artazcoz, 2009) and one for men only (Alexandrino-Silva, Ferraz Alves, Fernando, Wang & Andrade, 2011). All these analyses were in the expected direction (negative associations) but the study of Lien et al. (2009) found a significant- but positive- association between social support and anxiety (i.e. those with more support were more anxious). Leung, Chen, Lue & Hsu's (2007) study found various results depending on the type of social support, there were significant associations between emotional support and depression and anxiety, but associations with instrumental support were not significant.

Of 14 analyses examining the associations between received support and mental health, eight found significant negative associations (Lee & Dunkle, 2010; Safezadeh, 2009; Rueda & Artazcoz, 2009), four no significant associations and two found significant positive associations (Cruza-Guet et al., 2008). Wong, Yoo and Stewart (2007) and Cruza-Guet et al. (2008) found varying results depending on the outcome measure used and the type of social support.

Considering results by studies rather than analyses, we found that of 14 studies examining perceived support, nine studies found only significant associations with mental health, two studies no significant associations and three studies reported mixed results. Of the six studies examining received support, three found significant associations with mental health, one study found no significant association and two studies reported mixed results. In short, results of analyses using measures of received social support appear more diverse than those using perceived social support.

With regard to the associations between types (functions) of social support and mental health, the results showed a relatively strong association between emotional support and mental health. Six of eight analyses (Lee & Dunkle, 2010; Rueda & Artazcoz, 2009; Cruza-Guet et al., 2008; Wong et al., 2007, Leung et al., 2007) found a significant association.

However, the evidence for an association between instrumental support (particularly perceived instrumental support) and depression is comparatively weak - only two out of six analyses (Lee & Dunkle, 2010; Cruza-Guet et al., 2008) showed a significant association. Other types of social support (n=4) including informational, financial and language support showed varying associations with mental health. Some differences by outcome are also reported in some studies. For example, Wong et al. (2007) found that emotional social support was significantly associated with depression and overall mental health score but not with anxiety, while financial social support was associated with anxiety only. In summary, evidence for an association between emotional social support and mental health appears stronger than evidence for associations between instrumental or other types of social support.

Regarding associations between structural aspects of social support and mental health, Han et al. (2007) found no significant relationship between the size of support networks and depression. Jawad et al. (2009) found that having more children was associated with a lower risk of depression but no significant association was found between presence of a spouse and depression.

In summary, the results reported here from studies considering the main effects of social support on mental health are mixed. Overall, of the 40 analyses performed in the 18 studies, 22 showed a significant protective association (including one only in men and one only in women), 15 analyses found no significant associations and three analyses found a significant but positive association between social support and worse mental health. Consequently, these results lend some support to the hypothesis of a protective main effect of support, but are far from conclusive.

Stress-buffering associations between social support and mental health

Overall, eight studies examined the relationships between life stress, social support, and mental distress. Some of these studies examined the buffering effect of various types of social support on different stressors and mental health measures so overall 18 analyses were reported. Most of these studies (n=6) used hierarchical multiple regression analysis. The studies considered various types of stressors; either a specific type of life stress such as financial stress (Cruza-Guet et al., 2008), or general stresses of life (Nemeroff et al., 2010) measured by scales. Health related stressors including limitations in ADL functioning, cognitive impairment and chronic diseases received the most attention (Bierman & Statland, 2010; Bozo et al., 2009; Leung et al., 2007). The results indicated that all stressors measured in these studies were significantly (and positively) associated with mental health, except the general stressors of life measured in Nemeroff et al. (2010)'s study.

The studies that examined the stress-buffering effect model, hypothesized that social support would moderate the deleterious effects of life stresses on mental health. However, of 18 analyses only two found a significant moderating role for social support. Leung et al. (2007) examined the buffering effects of perceived instrumental and emotional support in the presence of health stressors (cognitive impairment and chronic diseases) on depression

and anxiety. Results suggested a possible buffering effect of emotional support on depression in the presence of cognitive impairment but other interactions examined were not statistically significant. Lee and Dunkle (2010) found that received emotional support from adult children, but not instrumental support, had a powerful buffering effect on the relationship between general stresses of life and depressive symptoms.

Role of gender and sources of support in associations between social support and mental health

The studies considered in this review shed little light on possible gender differences in the association between social support and mental health status. Only two studies in this review examined gender differences. Alexandrino-Silva et al. (2011) found that perceived lack of social support was associated with depression among men, but not women. The authors attributed this finding to a differential effect of widowhood, as widowers may be more vulnerable than widows to a lack of spousal support. Rueda and Artazcoz (2009), by contrast, consistent with the wider literature found that perceived emotional support was associated with mental health status among women but not men. In short, evidence on gender differences in the associations between social support and mental health is limited and not consistent.

Additionally, only a few studies considered whether sources of perceived or received support were associated with mental health. In a study from Lebanon (Jawad et al., 2009) no significant association was found between presence of a spouse and depression, while having more children was found to be associated with lower risks of depression. The studies of Alexandrino-Silva et al. (2011) in Brazil and Koosheshi (2007) found that while women tend to have a close confiding relationship with children, men usually depend more on their wives for this kind of support. In Western countries, support from friends may also have a considerable influence on mental health. Olutoyin Oni (2010) found that in Canada friend support was a better predictor of depression among older people than family support. However, this may not be the case for all Western societies. Consequently, the inconsistent evidence may suggest that the importance of support of a specific source may vary by gender, setting and culture.

Discussion of the systematic review

Overall, the studies included in this review provide evidence, albeit not wholly consistent, that social support has a moderate main, and a weak stress buffering effect on the mental health of older people. This conclusion differs from that reached in most of the old and new review studies, several of which have argued for a stronger association between social support and health. Three major reviews of the literature published in the 1970s (Kaplan et al., 1977; Cassel, 1976; Cobb, 1976), for example, suggested that there was a significant direct or modifying effect of social support on health and emphasized that much or most of the beneficial health effects of social relationships are due to their buffering properties in the presence of stress (Bowling, 1994). Additionally, Schwarzer and Leppin (1989) in their meta-analysis of 93 studies investigating the buffering hypothesis concluded that social support was the most important factor in modifying the health effects of hardship. A number of

more recent review studies have also reported that available evidence consistently supports a link between social support and health outcomes (Lakey & Orehek, 2011; Brewin, Andrews & Valentine, 2000; Finch, Okun, Pool & Ruehlman, 1999). However, there are also other reviews that have failed to find consistent significant main effects (George, 1989; Antonucci, 1985) or support for the buffering potential (Alloway & Bebbington, 1987) of social support on mental health. The result of our review of the six review articles, as presented above, showed generally moderate evidence to support the notion that social support has a protective effect on mental health.

The main difference between this review and the mentioned reviews is on the focus here on the older population. The imbalance between social support needs of older people and what they receive may explain the approximately weaker evidence for an association of social support and mental health in our review compared to other more general reviews. According to Contingent Theory, the effects of social support are contingent upon people's pre-existing needs (Cruza-Guet et al., 2008). Cruza-Guet et al. (2008) suggested that the benefits of receiving social support may only be evident when congruency between needs and amount of social support received is achieved. Another relevant factor is the small numbers of older people included in some studies (11 of 18 studies had sample sizes of less than 300), which may result in less statistical power to detect associations.

As noted earlier, evidence from the review to support the stress buffering role of social support was weak. Possibly this partly reflects the indicators of stressors used. Jawad et al. (2009) and Cruza-Guet et al. (2008), for example, used measures such as familial conflict or financial problems, while it has been suggested that health decline, for instance, is a more important stressor predicting depression in old age (Brilman & Ormel, 2001; Chong et al., 2001). With regard to the types of social support, stronger evidence was found for the association of emotional than instrumental or other types of social support with depression in this review. It has been suggested that in cross-sectional studies, the relationship between instrumental support and psychological symptoms may be confounded by the health status of participants. Ill people may receive more instrumental support than healthy subjects (Leung et al., 2007). Regarding the lack of a significant association between network size and depression, it has been discussed that network size alone is not a useful indicator of support and at least other quantitative aspects, such as frequency of contact with network members should also be considered (Han et al., 2007). In contrast to the expected negative association between social support and poor mental health, a number of studies in this review found a positive association. It has been suggested that ill-timed, unwanted, ineffective or excessive support may actually be stressful (Krause & Rook, 2003). This hypothesis is similar to the 'reverse buffering' effect that suggested the presence of social support does not protect from stress but actually exacerbates the trauma experience (Prati & Pietrantonio, 2010). However, most of evidence seems to point to helpful rather than harmful effects of social support (Prati & Pietrantonio, 2010).

Our review study is subject to a number of limitations that should be taken into account in interpretation of the results of this review study. Only one review author screened abstracts for relevancy and determined eligibility and extracted data which may be biased by the

reviewer. Only a few review and original studies were included with a high level of diversity, making the final estimation of the influence of social support on mental health of older people inadequate and meta-analyses was not performed. This review only included original studies published since 2007 and only used databases in English.

Conclusion

Diversity in the characteristics of the studies included in this systematic review, in addition to limitations in their size and methodology, as discussed above, makes comparisons and the estimation of the effects of social support on health complicated and the interpretation of their findings difficult. Nevertheless, overall at least a moderate importance of social support for mental health of older people was demonstrated in this study. Our review highlights the following significant gaps in the social support and mental health literature for future research:

- Studies of associations among older people are sparse.
- Most research to date has been conducted in Western countries. Studies need to be conducted across other cultures and geographic boundaries.
- Few studies measured the complex concept of social support comprehensively by its all dimensions and aspects and at the same time also examined its main and buffering effects on mental health. The complexity of social support theories should be matched by the instruments developed and piloted appropriately for each context.
- The role of structural aspects of social support in mental health wellbeing is less researched.
- The evidence on gender differences in the association between social support and mental health is limited and inconclusive.
- The role of different sources of social support in relationships between social support and mental health needs further investigation.
- Studies with prospective research design are sparse. Also, intervention studies are needed to investigate the effectiveness of social support on mental health.

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