

Review

Psychological factors associated with financial hardship and mental health: A systematic review

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HIGHLIGHTS

- A number of studies suggest that financial hardship impacts mental health.
- A range of psychological variables appear to be related to this relationship.
- The greatest evidence is for a role for personal agency, self-esteem and coping.
- Studies are limited by poor measurement of finances and cross-sectional design.

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Psychological
Personal agency
Coping, self-esteem

ABSTRACT

A review of the literature investigating the role of psychological factors in the relationship between financial hardship and mental health was completed. The review sought to identify which factors have been most consistently and reliably indicated, and the mechanisms by which these factors are proposed to contribute to the association between hardship and mental health. Although the review identified that a broad variety of factors have been investigated, skills related to personal agency, self-esteem and coping were most frequently and reliably associated with the relationship between financial hardship and mental health outcomes. Just over half of the studies reviewed concluded that the psychological factor investigated was either eroded by financial hardship, increasing vulnerability to mental health difficulties, or protected mental health by remaining intact despite the effects of financial hardship. The remaining studies found no such effect or did not analyse their data in a manner in which a mechanism of action could be identified. The methodological quality of the research included in the review was variable. The valid and reliable measurement of financial hardship, and conclusions regarding causation due to the use of predominantly cross-sectional design were areas of particular weakness.

1. Introduction

1.1. Poverty and mental health

Poverty is experienced when an individual's resources cannot adequately meet the basic needs deemed reasonable within their societal context (Goulden and D'Arcy, 2014). Government figures for 2014/15 indicate that 21% of the UK population were in relative poverty (McGuinness, 2016), defined as households with a disposable income below 60% of the median for the population. Insufficient financial and material resource has consequences for food, shelter, warmth, leisure, and social participation. The lack of which exposes individuals and their families to economic and social disadvantages which may be detrimental to their health, such as inadequate housing, poor

nourishment, discrimination and social isolation (Wilkinson & Marmot, 2003).

Poverty and low socioeconomic status (SES) have long been associated with poor health outcomes. People experiencing deprivation are at increased risk of illness and disability, for example demonstrating greater prevalence and mortality from cardiovascular disease (Lee & Carrington, 2008) and cancer (Quaglia, Lillini, Mamo, Ivaldi, & Vercelli, 2013), worse outcomes in diabetes (Grintsova, Maier, & Mielck, 2014), and higher rates of obesity (El-Sayed, Scarborough, & Galea, 2012). Additionally, people living in deprived areas have an average life expectancy seven years shorter than people of a high SES (Department of Health, 2011), and can expect to experience disability up to 16 years earlier (Office for National Statistics, 2016).

Several studies have shown a relationship between mental health

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and poverty, though questions about causality remain poverty may be both a cause and consequence of poor mental health (Fell & Hewstone, 2015). Social drift theory proposes that the detrimental effects of poor mental health on areas such as employment and housing, increase vulnerability to experiencing poverty (Timms, 1998). The Monitoring Poverty and Social Exclusion report (MacInnes, Tinson, Hughes, Born, & Aldridge, 2015) indicates that 26% of women and 23% of men in the lowest socioeconomic group were assessed as being at high risk of developing a mental health difficulty. The prevalence of depression (OR = 1.81, Lorant et al., 2003) and psychosis (OR = 2.6, Harrison, Gunnell, Glazebrook, Page, & Kwiecinski, 2001) is higher among people in low SES groups; and they are more likely to be admitted to psychiatric hospital (Koppel & McGuffin, 1999).

The relationship between mental health and poverty is complex as many variables may interact with another, making causality and mechanisms challenging to establish. Poverty exposes individuals to chronic long-term stressors, such as crime and violence (Belle, Longfellow, Makosky, Saunders, & Zerkowitz, 1981), poor housing (Evans, Wells, Chan, & Saltzman, 2000), and inadequate financial resources (Salomon, Bassuk, & Brooks, 1996). These stressors may promote fear, worry and hopelessness (Gallo & Matthews, 2003) and a sense of powerlessness to exert control over their situation (Goodman, Smyth, & Banyard, 2010). Additionally, the lack of material resources may undermine the formation and maintenance of supportive social relationships (Payne, 2000); while the stigma and discrimination associated with living in poverty and claiming welfare payments can be experienced as humiliating and shameful (Davis & Hagen, 1996).

While poverty might lead to additional stressors and challenges which can impact wellbeing, it is also clear that not all people in poverty will go on to develop mental health disorders. For example, Kiely, Leach, Olesen, & Butterworth, 2015), found higher rates of mental health problems in those with income poverty. However, the majority (80.5%) of the lowest income group still did not meet such criteria. In fact, people can demonstrate considerable resilience and agency in times of adversity (Marttila, Johansson, Whitehead, & Burström, 2013). While measures of poverty assume a lack of resources, income is not a reliable and effective indicator of resource or deprivation (Layte, Maitre, Nolan, & Whelan, 1999), given variable costs and circumstances, such as housing, travel, number of dependents, and health needs.

2. Financial hardship and mental health

The concept of financial hardship directly measures the nature and extent of deprivation that a person is experiencing due to a lack of financial resources and relative to their own needs (Mack & Lansley, 1985). Difficulty paying bills, purchasing food and clothes, and affording suitable housing, utilities, health care, and transport costs are examples of the areas that have been assessed as indicators of financial hardship (Lewis et al., 1998; Lorant et al., 2007; Mack & Lansley, 1985; Mirowsky & Ross, 1999).

Butterworth, Olesen, and Leach (2012) found that the risk of depression was statistically stronger for financial hardship than other measures of income and SES such as occupation. Lahelma, Laaksonen, Martikainen, Rahkonen, and Sarlio-Lähteenkorva (2006) similarly showed that economic difficulties were more strongly predicted by the presence of common mental disorders than other SES variables such as education and home ownership. Those with depression, psychosis, substance use issues and suicide completers are significantly more likely to have debt problems. However, much research in the area is cross-sectional so which causes which is unclear (Richardson, Elliott, & Roberts, 2013).

People experiencing financial hardship are at an increased risk of developing mental health problems (OR = 2.94, Kiely et al., 2015), and hardship may be the factor most predictive of moderate to severe mental disability (Crosier, Butterworth, & Rodgers, 2007). Financial

hardship has been associated with greater depression (Mirowsky & Ross, 2001) and increased self-harm behaviours (Barnes et al., 2016). Increases in suicide rates have also been found in times of economic crises (Branas et al., 2015; Konstantinos & Fountoulakis, 2020; Korhonen, Puhakka, & Viren, 2016).

3. Psychological variables

Financial hardship and mental health research does, however, raise the same questions as the evidence of the link between poverty and mental health: not all people experiencing financial hardship will develop mental health difficulties. The mechanism by which people respond differently to financial stress may be explained by the Stress Process Model (Pearlin, Menaghan, Lieberman, & Mullan, 1981). This model contends that the impact of chronic stressors is not limited to the direct effect of reduced resources on mental health; they also impact upon personal and social resources which may prevent or mitigate their harmful effects. Chronic stressors, such as financial hardship, may, therefore, erode psychological resources, such as mastery and self-esteem, increasing vulnerability to the development of mental health problems. The stress buffering hypothesis (Wheaton, 1985) supports the idea that psychological resources that remain intact, despite exposure to stressors, may protect mental health from the effects of stress. Burgeoning research in this area has identified characteristics such as locus of control (Culpin, Stapinski, Miles, Araya, & Joinson, 2015), personality type (Cuesta & Budría, 2014) and self-esteem (Barnes et al., 2016) as resources implicated in the development of or protection from mental health difficulties.

4. Scope of the review

Though several studies demonstrate a link between financial hardship and risk of mental health problems, a lack of attention has been paid to the possible mechanisms by which this occurs. Not all people who are experiencing financial difficulties go on to develop a diagnosable mental health condition, highlighting the importance of understanding how variations in personal experience enhance or worsen the risks of hardship to mental health. Given the theorised impact of stress on mental health via psychological resources, this review aims to explore which psychological factors may be vulnerable to erosion by financial hardship, and which, if remaining intact, offer some protection for mental health from such stressors.

While a variety of psychological characteristics, variables and traits have been considered concerning this relationship, to the authors' knowledge, there has been no review of the evidence about these factors. This systematic review, therefore, aims to review all studies which have considered psychological factors in the context of the relationship between financial hardship and mental health, to identify which factors are most consistently and reliably implicated. The review also seeks to establish the mechanisms by which these factors are proposed to contribute to the association between hardship and mental health.

5. Method

5.1. Databases and search terms

The electronic databases of Web of Science and PubMed were searched in October and November 2016 for studies published up to and including October 2016, and again in February 2019 for studies published between November 2016 and January 2019. The following combination of search terms were used to search all fields: 'mental health' or 'mental illness' or 'mental disorder' or 'depression' or 'anxiety' or 'suicide' or 'eating disorder' or 'psychosis' or 'schizophrenia' or 'stress' or 'distress' or 'drugs' or 'alcohol' and 'poverty' or 'financ* difficult*' or 'financ* hardship' or 'economic difficult*' or 'economic hardship' or 'debt' or 'indebtedness' or 'state benefits' or 'low income'.

6. Inclusion and exclusion criteria

Papers were included in the review if they were research studies of any design, including secondary analyses, featured in a peer-reviewed journal and written in English. Thus reviews, commentaries, and analyses relating to the area were not included. For inclusion in the review, studies had to explore the impact of the experience of financial difficulties on mental health in adults and consider the influence of one or more psychological constructs, defined as qualities, attributes, traits or emotional states of the individual. Studies were excluded if they also focussed on the impact on mental health of another major variable, for instance, a physical health condition or domestic violence. Inclusion required that both mental health and psychological variables were quantified using a standardised measure. In most cases this required the scale to be either the full measure, but could also be a condensed version that has been reliably used in previous research. Subscales of measures also qualified if commonly used and demonstrating reliability and validity in their use. Financial difficulties must have been explicitly measured with at least one question pertaining to the manageability of participants' financial situation and indicating a lack of some financial or material resource and analysed with regard to this measure. Papers were therefore excluded where financial status was assessed based on income alone; was presumed by the community, service or population from which participants were sampled, such as residing in a deprived area; or if questions relating to financial difficulties were included within scales that also assessed other constructs and were not analysed separately. Research studies on financial difficulties resulting from poor mental health were also excluded.

7. Search procedure

The title of papers was initially screened for relevance to the inclusion/exclusion criteria. The abstracts of the titles that indicated or suggested the study of financial hardship, mental health, and a psychological variable were reviewed. The papers accepted at the abstract received a full paper review. At the updating of the review in February 2019, each paper included in the review underwent a citation search (up to and including 31st January 2019). A record was kept of the reasons for rejection. In addition, each included paper was hand-searched for additional references.

8. Results

A flow diagram of the systematic search is shown in Fig. 1. The search terms on two databases retrieved 38,546 papers in total. Of these 2209 abstracts were screened, and a full review was completed of 398 papers. Thirty seven papers were accepted as meeting the criteria. A further 1796 papers were retrieved by the cited by search, of which 49 abstracts were screened, and 26 full papers were reviewed. This search yielded an additional three papers, and a further four papers were identified from the reference lists of these papers, resulting in a total of 44 papers to be reviewed.

At the title review stage, papers were most commonly rejected for being not relevant, as the broad range of search terms meant the majority did not relate to the area of interest of mental health and financial difficulties. Papers were also commonly rejected for having multiple reasons for exclusion, meaning that they fulfilled two or more of the following exclusion criteria: review or commentary; no consideration of psychological variables; study conducted with children only; financial difficulties and mental health considered in the context of physical health or domestic violence; and financial difficulties studied as a consequence of mental health. At the abstract and full paper review stages, papers were most commonly rejected for demonstrating no inclusion of a psychological variable, having no separate measure or analysis of financial hardship, or not assessing mental health or the psychological variables using standardised measures.

9. Characteristics of studies

The key characteristics of the identified studies are summarised in Appendices A to G in terms of methodological design, sample, measures used, main findings and confounding variables considered. It also includes a rating of methodological quality using the Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (National Heart Lung and Blood Institute, 2014) as these study designs were most predominantly used in the literature reviewed. The majority of the studies were conducted in the US ($n = 19$), Australia ($n = 7$), Hong Kong ($n = 4$) and the UK ($n = 2$). Two studies were conducted cross-nationally, one in Belgium, Germany, Portugal and Spain; and the other in Finland and the UK. One study per country was carried out in Austria, Canada, Finland, Greece, Iceland, Korea, Russia, Spain, Sweden, and New Zealand. In terms of methodological design, studies were principally cross-sectional ($n = 24$), of which four were retrospective, and longitudinal ($n = 11$), of which six were prospective and five retrospective. Other designs used were panel studies ($n = 4$), psychological autopsy ($n = 2$), retrospective cohort ($n = 2$), and randomized controlled trial ($n = 1$). Methodological quality was rated as fair in the majority of studies ($n = 27$). Nine studies were rated as good and eight were given a rating of poor using the assessment tool (see Table 1).

10. Measures

The analyses of the studies in this systematic review will refer only to those findings from validated measures of psychological variables and mental health, and will not include any relationship to non-psychological variables that may also have been assessed.

10.1. Measures of financial hardship

Financial hardship was predominantly assessed by replicating or adapting scales used in other research studies ($n = 17$), of which seven were assessed for internal reliability; or via author constructed questions specifically for the study ($n = 16$), of which six studies assessed internal reliability.

Validated measures were used in ten studies, most commonly the Economic Health Questionnaire (EHQ, Lempers, Clark-Lempers, & Simons, 1989) ($n = 3$) and The Conservation of Resources Evaluation using 19–23 item versions (Hobfoll & Lilly, 1993) ($n = 4$). The financial subscales of the Checklist of Problems and Concerns (Berman & Turk, 1981), the Latent and Manifest Benefits Scale (Muller, Creed, Waters, & Machin, 2005), and the Personal Financial Wellness Scale (Prawitz et al., 2006) were each used in one study. All but one study were self-report measures of financial difficulty, the exception using The Life Events and Difficulties Schedule (LEDS, Brown & Harris, 1989) and detailed financial questioning to objectively rate the extent of financial difficulties in participants.

10.2. Measures of mental health

The studies most commonly used general tools to measure mental health outcomes ($n = 25$). Nine studies used the General Health Questionnaire (GHQ) in standard (Goldberg & Hillier, 1979) and shortened form (GHQ-12, Goldberg, 1992). Three studies used the Brief Symptom Inventory (Derogatis, 1993), and another three used the Structured Clinical Interview, one using the DSM-III-R (Spitzer, Williams, Gibbon, & First, 1992) version and two studies using the DSM IV (First, Spitzer, Gibbon, & Williams, 1995) version. The Hopkins Symptom Checklist (HSCL, Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974) was used by two studies, as was the Kessler Psychological Distress Scale (K10, Kessler et al., 2003). The Shortened Present State Examination (PSE, Wing, Cooper, & Sartorius, 1974), the Mental Health Inventory-5, and the Short Form 36 Health Survey Questionnaire (SF-36, Ware, Kosinski, Dewey, & Gandek, 2000) from which

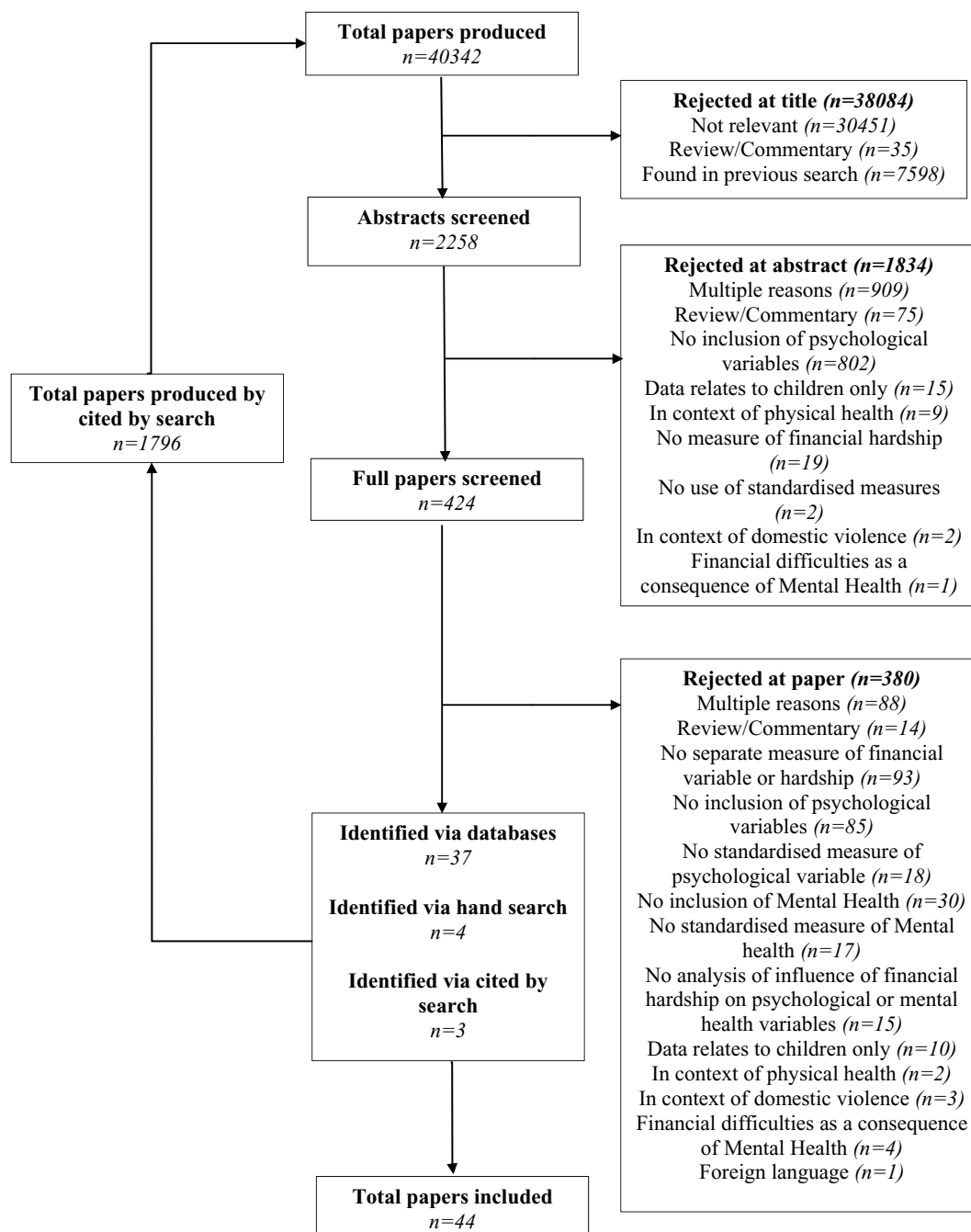


Fig. 1. Flow diagram of systematic search.

it is drawn, The Symptom Checklist-90-Revised (SCL-90-R, [Derogatis & Unger, 2010](#)), Turner's Emotional Well-being Scale ([Turner, 1981](#)), the Chinese version of the Life Satisfaction Index ([Neugarten, Havighurst, & Tobin, 1961](#)) were all used by one study each.

While some studies only used a general measure ($n = 20$), others used these in conjunction with measures of specific mental health difficulties ($n = 4$). Fourteen studies used scales that measured one specific mental health difficulty, while five used multiple measures to assess more than one specific mental health difficulty. Depression was the mental health condition most commonly measured ($n = 20$) and was predominantly measured using the original or a shortened version of the Centre for Epidemiological Studies Depression Scale (CES-D, [Radloff, 1977](#)) ($n = 10$). Four studies used the Beck Depression Inventory (BDI, [Beck, Steer, & Brown, 1996](#)), including one study which used the BDI in conjunction with the Research Diagnostic Criteria (RDC, [Spitzer, Endicott, &](#)

[Robins, 1978](#)). Three studies utilised the depression scale from the Profile of Mood States (POMS, [McNair, Lorr, & Droppleman, 1981](#)); while the Goldberg Depression Scale ([Goldberg, Bridges, Duncan-Jones, & Grayson, 1988](#)), the depression scale from the SCL-90-R ([Derogatis & Unger, 2010](#)), the Patient Health Questionnaire ([Kroenke & Spitzer, 2002](#)), and the depression scales of the Mini Mood and Anxiety Symptom Questionnaire ([Clark & Watson, 1995](#)) were each used in one study.

Anxiety was measured in nine studies. Three utilised the anxiety trait subset from the State-Trait Anxiety Inventory ([Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983](#)). The 7-item Generalized Anxiety Disorder Scale ([Spitzer, Kroenke, Williams, & Löwe, 2006](#)); the Penn State Worry Questionnaire (PSWQ, [Meyer, Miller, Metzger, & Borkovec, 1990](#)), the anxiety scales from the SCL-90-R ([Derogatis & Unger, 2010](#)), the POMS ([McNair et al., 1981](#)) and the anxiety scale of the Mini Mood and Anxiety Symptom Questionnaire ([Clark & Watson,](#)

Table 1
Study quality ratings using the Quality Assessment Tool for Observational Cohort and Cross-sectional Studies.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
Objective clearly stated	Study pop.	Participation rate	Participant uniformity	Sample size justification	Exposure assessed pre outcome	Sufficient timeframe	Different exposure levels	Exposure measures	Repeated exposure assessment	Outcome measures	Blinding	Follow-up rate	Stats analyses	Overall rating
Burdette & Hale (2011)	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	YES	GOOD
Drentea & Reynolds (2015)	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	NO	YES	YES	GOOD
Emmis et al. (2000)	NO	NR	YES	YES	NO	NO	YES	YES	NO	YES	NO	NA	YES	GOOD
Hill et al. (2013)	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	YES	GOOD
Hobfoll et al. (2003)	NO	YES	YES	YES	NO	YES	YES	YES	YES	YES	NO	NO	YES	GOOD
Karadenas and Roussi (2017)	YES	CD	YES	YES	NO	NO	YES	YES	NO	YES	NA	NA	YES	GOOD
Krause (2012)	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	NO	NO	YES	GOOD
Wadsworth et al. (2011)	YES	NR	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO	NO	GOOD
Wickrama et al. (2011)	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NA	YES	YES	GOOD
Braver et al. (1989)	YES	NR	YES	YES	NO	NO	YES	YES	NO	YES	NO	NA	NO	FAIR
Brown and Moran (1997)	YES	CD	YES	YES	NO	YES	NO	YES	NO	NO	YES	YES	YES	FAIR
Chou and Chi (2002)	YES	YES	YES	NO	NO	NO	YES	YES	NO	YES	NO	NA	YES	FAIR
Creed et al. (2001)	YES	NR	YES	YES	NO	NO	YES	YES	NO	YES	CD	NA	NO	FAIR
Creed and Muller (2006)	YES	NR	NO	YES	NO	NO	YES	YES	NO	YES	CD	NA	YES	FAIR
Crowe and Butterworth (2016)	YES	YES	YES	YES	NO	YES	NO	NA	YES	YES	NA	YES	YES	FAIR
Crowe et al. (2016)	YES	YES	YES	NO	NO	YES	NO	NA	YES	YES	NA	YES	YES	FAIR
Cole et al. (2003)	YES	YES	YES	YES	NO	NO	YES	NO	NO	NO	NO	NA	YES	FAIR
Handley et al. (2013)	YES	NO	YES	YES	NO	YES	NO	NO	YES	YES	CD	NO	YES	FAIR
Heilemann et al. (2002)	YES	CD	YES	YES	NO	NO	NO	NO	NO	YES	NA	NA	YES	FAIR
Hughes et al. (2014)	YES	YES	YES	YES	NO	NO	NO	NO	NO	YES	NO	NA	YES	FAIR
Hurwich-Reiss et al. (2015)	YES	NR	YES	YES	NO	NO	YES	YES	NO	YES	NO	NA	YES	FAIR
Jessop et al. (2005)	YES	YES	YES	YES	NO	NO	YES	YES	NO	YES	NA	NA	YES	FAIR
Kivimaki (2002)	YES	YES	YES	YES	NO	YES	YES	NO	YES	YES	NA	YES	NO	FAIR
Lange and Byrd (1998)	YES	NR	YES	NO	NO	NO	YES	NO	NO	YES	NA	NA	NO	FAIR
Marjanovic et al. (2015)	YES	NR	NO	YES	NO	NO	YES	NO	NO	YES	NA	NA	NO	FAIR
Meyer and Lobao (2003)	NO	YES	YES	YES	NO	NO	YES	YES	NO	YES	CD	NA	YES	FAIR
Nelson (1989)	YES	NO	YES	YES	NO	YES	YES	NO	YES	NO	NO	YES	NO	FAIR
Norvilitis et al. (2003)	YES	YES	YES	YES	NO	NO	YES	YES	NO	YES	NA	NA	NO	FAIR
Olsson & Hwang (1987)	YES	NO	NO	YES	NO	NO	NO	YES	NO	YES	NA	NA	YES	FAIR
Ritter et al. (2000)	YES	YES	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES	FAIR
Selenko & Batinic (2008)	YES	CD	YES	YES	NO	NO	YES	YES	NO	YES	NA	NA	YES	FAIR
Shim et al. (2017)	YES	YES	YES	NO	NO	YES	YES	NO	YES	YES	NA	CD	YES	FAIR

(continued on next page)

Table 1 (continued)

1. Objective clearly stated	2. Study pop.	3. Participation rate	4. Participant uniformity	5. Sample size justification	6. Exposure assessed pre outcome	7. Sufficient timeframe	8. Different exposure levels	9. Exposure measures	10. Repeated exposure assessment	11. Outcome measures	12. Blinding	13. Follow-up rate	14. Stats analyses	15. Overall rating
Shiteyn et al. (2003)	YES	CD	NO	NO	NO	NO	YES	YES	NO	YES	NA	NA	NO	FAIR
Taylor et al. (2012)	YES	YES	YES	NO	NO	NO	YES	NO	NO	YES	CD	YES	YES	FAIR
Vilhjálmsdóttir et al. (1998)	YES	YES	YES	YES	NO	NO	NO	NO	NO	YES	NA	NA	YES	FAIR
Weinstein and Stone (2018)	NO	NR	YES	NO	NO	NO	YES	YES	NO	YES	NA	NA	YES	FAIR
Chen et al. (2006)	YES	NO	YES	YES	NO	NO	NO	NO	NA	NO	NO	NA	YES	POOR
Elahi et al. (2018)	YES	YES	YES	NO	NO	NO	NO	NO	NO	YES	NA	NA	YES	POOR
Gonzalez-Marin et al. (2018)	YES	NO	YES	NO	NO	NO	NO	NO	NO	NO	NA	NA	YES	POOR
Law et al. (2014)	YES	NO	YES	YES	NO	NO	NO	NO	NA	NO	NO	NA	NO	POOR
Lee et al. (2000)	YES	YES	YES	YES	NO	YES	NO	NO	NO	YES	NR	NO	NO	POOR
Renner et al. (2015)	YES	NO	YES	YES	NO	NO	NO	NO	NO	NO	NA	NA	YES	POOR
Scanlon et al. (2018)	YES	NO	YES	NO	NO	YES	NO	NO	NO	YES	NO	NA	YES	POOR
Waters and Muller (2003)	YES	NO	YES	YES	NO	YES	NO	NO	YES	YES	NA	NO	NO	POOR

Key:

1. Was the research question or objective in this paper clearly stated?

2. Was the study population clearly specified and defined?

3. Was the participation rate of eligible persons at least 50%?

4. Were all the subjects selected or recruited from the same or similar populations (including the same time period)? Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants?

5. Was a sample size justification, power description, or variance and effect estimates provided?

6. For the analyses in this paper, were the exposure(s) of interest measured prior to the outcome(s) being measured?

7. Was the timeframe sufficient so that one could reasonably expect to see an association between exposure and outcome if it existed?

8. For exposures that can vary in amount or level, did the study examine different levels of the exposure as related to the outcome (e.g., categories of exposure, or exposure measured as continuous variable)?

9. Were the exposure measures (independent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?

10. Was the exposure(s) assessed more than once over time?

11. Were the outcome measures (dependent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?

12. Were the outcome assessors blinded to the exposure status of participants?

13. Was loss to follow-up after baseline 20% or less?

14. Were key potential confounding variables measured and adjusted statistically for their impact on the relationship between exposure(s) and outcome(s)?

15. Overall quality rating

Abbreviations: CD = cannot determine; NA = not applicable; NR = not reported

1995) were each used by one study. Two studies measured stress, one each using the Perceived Stress Scale (PSS, Cohen, Kamarck, & Mermelstein, 1983) and the stress subscale from the Depression Anxiety Stress Scale (Lovibond & Lovibond, 1995). The Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) module (First et al., 1995), used to assess Antisocial Personality Disorder, and a 5-item version (Scheidell et al., 2016) of the Borderline Evaluation of Severity Over Time Scale (Pfohl et al., 2009) were used once each.

10.3. Measures of psychological factors

A variety of psychological variables were investigated across the studies, with 12 assessing more than one. The most frequently examined variable was self-esteem ($n = 13$), and eight studies investigated it as the sole psychological factor. Eleven studies used the Rosenberg Self-Esteem Scale (Rosenberg, 1965), one of which also used the Global Self Worth subscale from the Adult Self Perception Profile (ASPP, Messer & Harter, 1986). The Self-Esteem Inventory (Coopersmith, 1967) and the single-item self-esteem scale (Robins, Hendin & Trzesniewski, 2001) were used in one study each. Variables related to a sense of personal agency were also commonly assessed. Mastery was measured in eight studies and was in all cases assessed using the Pearlin Mastery Scale (Pearlin & Schooler, 1978). Four studies explored the impact of locus of control, which was most commonly measured using the Internal-external Locus of Control Scale (Rotter, 1996) ($n = 3$), while one study utilised the Economic Locus of Control Scale (Furnham, 1986). Two studies utilised the General Self-Efficacy Scale (Schwarzer & Jerusalem, 2010). The 24-item basic psychological need scale (Chen et al., 2015) measures autonomy and competence (as well as relatedness) and was used in one study.

The ability of participants to manage difficulties was frequently investigated. Five studies looked at the influence of coping. The Coping Strategies and Resources Inventory (CSRI, Berman & Turk, 1981), the Dyadic Coping Inventory (Bodenmann, 2008), and the Selective Optimization with Compensation questionnaire (Baltes, Baltes, Freund, & Lang, 1995) were used in one study each. The construction and validation of a measure occurred within the course of the study itself (Meyer & Lobao, 2003), while one study used both the Coping Efficacy measure (Sandler, Tein, Mehta, Wolchik, & Ayers, 2000) and Responses to Stress Questionnaire (RSQ, Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000) to measure coping. Capacity for problem-solving ($n = 3$), was assessed using the Social Problem-Solving Inventory (SPSI, D'Zurilla & Nezu, 1990) ($n = 2$), and The Communication Skills Test (Stanley et al., 2001) ($n = 1$). Psychological flexibility was investigated in one study via the Acceptance and Action Questionnaire-II (AAQ II, Bond et al., 2011); and one study used the Resilience Scale (Wagnild & Young, 1993).

Studies also explored the impact of psychological dispositions. Neuroticism was commonly assessed ($n = 3$), in each case utilising Eysenck's Personality Questionnaire (Eysenck, 1991). Impulsivity was investigated in three studies via the Impulsivity Rating Scale (IRS, Lecrubier, Braconnier, Said, & Payan, 1995) ($n = 2$) and in one study the Dickman Functional and Dysfunctional Impulsivity Scales (Dickman & Meyer, 1988). Self-control using the Brief Self-Control Scale (Brief SCS, Tangney, Baumeister, & Boone, 2004) and optimism using the Life Orientation Test (Scheier, Carver, & Bridges, 1994) was measured in one study each. Emotions were also assessed for their impact: anger in two studies using the State version of the State-Trait Expression Inventory (STAXI, Spielberger, 1988); and another looking at shame using the 10-item Shame Scale (Harder & Zalma, 1990). Other psychological variables investigated were sense of coherence ($n = 3$) on the domains of comprehensibility, meaningfulness, and manageability using Antonovsky's (1987) short orientation to life questionnaire. The SCL-90-R Interpersonal Sensitivity (Derogatis & Unger, 2010) scale; the Self-Evaluation and Social Support schedule (SESS, O'Connor & Brown,

1984); the Multigroup Ethnic Identity Measure (Phinney, 1992); the Money Attitude Scale (Yamauchi & Templer, 1982); and the Wisconsin Card Sorting Test (Lezak, Howieson, Bigler, & Tranel, 2012) to assess Executive Function were used by one study each.

11. Self-esteem

Self-esteem refers to a person's evaluation of their self-worth (Rosenberg, 1965). The studies investigating self-esteem numbered eight and are shown in Appendix A. The Rosenberg Self-Esteem Scale (Rosenberg, 1965) was used by all but one study. The exception being Elahi et al. (2018) which used the Single Item Self-esteem Scale (Robins, Hendin, & Trzesniewski, 2001).

The retrospective analysis by Wickrama, Surjadi, Lorenz, Conger and O'Neal (2012) of longitudinal data from the Iowa Youth and Families Project and the Iowa Midlife Transition Project suggested a role for self-esteem in the relationship between financial hardship and mental health in spouses. Financial hardship served to diminish self-esteem, which led to later depression, and self-esteem and depression had a mutual and longitudinal influence on one another. Shim, Lee, and Kim (2017) also looked at longitudinal data of spousal relationships, in their study from the Korean Welfare Panel Study (KOWEPS). They found that couples experiencing financial hardships tended to have higher depression scores and lower self-esteem and that these factors had a mediatory effect leading to reduced satisfaction with family and spousal relationships. Elahi et al.'s (2018) general population cross-sectional study also identified a mediatory effect of self-esteem. Financial hardship reduced self-esteem, which increased depression, anxiety, and paranoia. In this study, the effect of self-esteem was moderated by neighbourhood identity.

Two of the studies conducting secondary analyses utilised the same data from the Welfare, Children, and Families (WCF) project (Burdette, Hill, & Hale, 2011; Hill, Reid, & Reczek, 2013). Burdette et al. (2011) used the WCF data to investigate the mediatory influence of self-esteem on the relationship between poor housing quality and mental health outcomes, with financial hardship treated as a potentially confounding variable. Though in the mediation analysis they found no effect attributable to self-esteem, multivariate analysis indicated that reduced self-esteem and increased financial hardship were significant contributory factors to a model of changes in psychological distress. This finding does not, however, give any insight into the mechanism by which these two factors interact with one another to impact mental health. Utilising the same data, Hill et al. (2013) found that lower levels of financial hardship in the context of continuous marriage were associated with reduced psychological distress. There was no mediatory influence of self-esteem. González-Marín et al. (2018) looked at the effect of economic deprivation in a group of people who were unemployed. They found that lowered self-esteem and difficulty with paying bills on time was associated with poorer mental health. There was no analysis of how these explanatory variables might interact with one another.

Ritter, Hobfoll, Lavin, Cameron, and Hulsizer (2000) focussed solely on depression in a sample of pregnant women. Though lower income and increased economic strain predicted depression, positive self-esteem did not mitigate these effects. Waters and Muller (2003) considered both depression and anxiety in addition to a general measure across two projects reported in the same study of unemployment. They also found no clear evidence for self-esteem as a significant influence on mental health in the context of financial challenges.

Generalisability of the findings to deprived communities is supported by the oversampling of those experiencing relative poverty (Burdette et al., 2011; Elahi et al., 2018; Hill et al., 2013; Shim et al., 2017) and the utilisation of an unemployed population (Waters & Muller, 2003). Culturally diverse samples were also typical (Burdette et al., 2011; Hill et al., 2013; Ritter et al., (2000). However, the studies of Waters and Muller (2003) and Wickrama, Surjadi, Lorenz, Conger, and O'Neal (2012) are limited by their small size and sample of only

White participants, respectively. In the majority of studies, financial hardship was measured or analysed in a manner which raises issues about their validity and reliability, using a very limited number of questions or reducing multiple questions to a dichotomized variable, or lacking detail about how hardship was measured (Elahi et al., 2018; González-Marín et al., 2018; Ritter et al., 2000; Shim et al., 2017; Waters & Muller, 2003). The remaining studies used comprehensive questions with good face validity, and which demonstrated acceptable reliability (Burdette et al., 2011; Hill et al., 2013; Wickrama et al., 2012). In contrast, the vast majority of scales measuring mental health and psychological factors demonstrated acceptable reliability, even when modified to account for sample-specific variations.

Confounding variables were analysed in all but one of the studies (Waters & Muller, 2003). Potential bias as a result of attrition was analysed in the majority of longitudinal studies (Burdette et al., 2011; Hill et al., 2013; Ritter et al., 2000). The study by Wickrama et al. (2012) was the only study in the literature reviewed to measure financial hardship prior to the outcomes. Difficulties in analyses are demonstrated in the Ritter et al. (2000) study, which amalgamated life stressors thus preventing analysis of the individual interactions with psychological and mental health variables, and Waters and Muller's (2003) study which grouped self-esteem and mental health together. González-Marín et al. (2018) dichotomized self-esteem scores risking the loss of information relating to individual differences and may lead to the overestimation of effect sizes and statistical significance (MacCallum, Zhang, Preacher, & Rucker, 2002). Furthermore, Waters and Muller's (2003) addition of a second arm to the study to ameliorate the effects of attrition and develop longitudinal evidence does not address the change in measures or difference in demographics across the two studies.

12. Personal agency

Personal agency can be defined as the ability to initiate and direct actions toward the achievement of defined goals (Zimmerman and Cleary, 2006). The studies explored the influence of mastery, locus of control, self-efficacy and sense of coherence in the context of financial hardship and mental health. These studies are summarised in Appendix B. All five studies assessing mastery, the sense of being knowledgeable or skilled, used the Pearlin Mastery Scale (Pearlin & Schooler, 1978). In Drentea and Reynolds' (2014) panel study of the general population, financial hardship caused reductions in mastery which independently mediated the relationships between financial hardship and depression and anxiety. In a study with women working as health and retail workers in Russia, Shteyn, Schumm, Vodopianova, Hobfoll, and Lilly (2003), in a cross-sectional study, found a partially mediatory role for mastery, such that economic losses were correlated with increased depression and anger via a sense of mastery.

The findings of Ennis, Hobfoll, and Schröder's (2000) study of women on low incomes was less clear about the role of mastery, as cross-sectionally it was related to a reduced relationship between hardship and depression in European Americans, but not in African Americans, for whom social support had a similar impact. Crowe and Butterworth's (2016) retrospectively analysed data from the Australian cohort study, the Personality and Total Health (PATH) Through Life Project, also a large population sample, with participants aged 20–24 at the outset. Unemployment was associated with increased rates of depression, and a low sense of mastery and financial hardship were identified as mediators of this relationship. These findings are supported by a similar study conducted by Crowe, Butterworth, and Leach (2016) analysing data from The Household Income and Labour Dynamics in Australia panel study (Wooden & Watson, 2007) with young people aged 20–34. They found that both financial hardship and a reduced sense of mastery were contributors to the difference in mental health outcomes of those un- or under-employed. Potential interaction relationships between these two variables were not explored in either study.

The concept of self-efficacy, an individual's belief in their ability to

complete tasks and meet goals, was measured by Selenko and Batinic (2011) in a relatively small sample of clients at a debt counselling service in Austria. They found that only perceived financial strain, rather than debt was related to worsened mental health, and that this effect was moderated by increased self-efficacy. Locus of control describes the extent to which a person believes they have the ability to be in control of their fortunes (Rotter, 1966). Both studies investigating this variable utilised the Internal-external Locus of Control Scale (Rotter, 1996). Krause (1987) conducted a panel survey with people aged over 65 assessing depression; while Jessop, Herberts, and Solomon's (2005) cross-sectional study compared general mental health outcomes of British and Finnish students.

Krause (1987) found that having an internalised locus of control reduced the impact of financial strain on depression and that the negative effects of chronic financial strain on depression were exacerbated in those with an external locus of control orientation. In addition, Krause's (1987) analysis separated the effects of hardship from depression to ensure that negative evaluations of financial position were not a consequence of depression. In contrast, Jessop et al. (2005) work found that while increased financial stress was associated with poorer mental health and emotional disturbance leading to role limitation at a single time point, there was little evidence of a mediatory role for locus of control. Antonovsky's (1987) Short Orientation to Life Questionnaire was used in two studies. It measures sense of coherence (SOC) along three components: comprehensibility, manageability and meaningfulness. Kivimäki, Vahtera, Elovainio, Lillrank, and Kevin (2002) looked at the role of SOC in sickness absence in a large sample of employees in Finland; while Olsson and Hwang (2008) compared its influence on parents of children with Intellectual Disabilities and control parents in Sweden. Kivimäki et al. (2002) found that increased psychological distress, indicated by increased anxiety and GHQ ratings and lowered SOC caused behavioural changes, the sum of which mediated the relationship between financial difficulties and increased sickness absence. The global concept of psychological distress, unfortunately, does not allow conclusions as to the nature or extent of SOC's impact. Olsson and Hwang (2008) found that increased SOC was associated with better mental health and when entered into a regression model, caused financial strain to no longer be a significant predictor of worsened well-being.

The sample of all the personal agency studies was broadly representative of the general population. Drentea and Reynolds' (2014) and Ennis et al. (2000) oversampled populations with physical disabilities and pregnant women respectively, which may reduce general representativeness, but may be more indicative of the stressors and consequences faced by people living with low incomes and reflect the reality that poverty is disproportionately a concern for mothers (Tucker & Lowell, 2015).

The measurement of financial hardship in these studies was of mixed quality. The studies predominantly used detailed measures which appear to have face validity in their assessment of the construct of financial hardship, and which also demonstrated acceptable reliability (Drentea & Reynolds, 2014; Ennis et al., 2000; Jessop et al., 2005; Krause, 1987; Olsson & Hwang, 2008; Selenko & Batinic, 2011; Shteyn et al., 2003). The remaining studies raise some significant issues in both the assessment and analysis of financial hardship. Changes in the measure used, insufficient detail and no assessment of internal consistency (Crowe & Butterworth, 2016; Kivimäki et al., 2002) raise concerns about validity and reliability. Also, the dichotomisation of scale scores (Crowe et al., 2016; Crowe & Butterworth, 2016; Olsson & Hwang, 2008) risks losing information relating to individual differences and may cause overestimation of effect sizes and statistical significance (MacCallum et al., 2002). The validity and reliability of the personal agency and mental health measures were predominantly acceptable across the studies.

Half the studies used a longitudinal design to explore the effects of variables over time thus allowing some conclusions to be drawn regarding causation (Crowe et al., 2016; Crowe & Butterworth, 2016; Drentea & Reynolds, 2014; Kivimäki et al., 2002; Krause, 1987). Unfortunately, Drentea and Reynolds (2014) only factored the influence of

prior mental health into the analysis. Analysis of how mastery and mental health changed over time as a consequence of financial situation in this sample would have given more information regarding causation. Interpretations of the remaining studies are limited by their cross-sectional design (Ennis et al., 2000; Jessop et al., 2005; Olsson & Hwang, 2008; Selenko & Batinic, 2011; Shteyn et al., 2003). Shteyn et al. (2003) was the only study in which confounding variables were not accounted for.

13. Personal agency and self-esteem

Five studies explored the impact of both personal agency and self-esteem on the relationship between financial hardship and mental health. These studies are summarised in Appendix C. The results of these studies indicated that both mastery and self-esteem are implicated in the experience of mental health difficulties in the context of financial stress. Positive racial identity was found to cross-sectionally mediate self-esteem and mastery from the eroding effects of economic strain (Hughes, Kiecolt, & Keith, 2014) from the National Survey of American Life (Jackson et al., 2004). Lange and Byrd (1998) explored two aspects of personal agency, economic locus of control and SOC, in conjunction with self-esteem in students in New Zealand. Cross-sectional path analyses of their findings revealed that financial strain impacts upon the sense of manageability and comprehensibility, both of which then influence the internal locus of control, the latter via the chance dimension of economic locus of control. Comprehensibility, in conjunction with meaningfulness, affects self-esteem, and both low self-esteem and lower scores on the internal dimension of locus of control influence depression, while lower scores on the internal dimension alone impact anxiety.

Marjanovic et al. (2015) sampled participants from multiple countries in Europe and considered financial threat in addition to financial situation. They concluded that threat partially mediated the relationship between financial situation and mental wellbeing and that reductions in both self-efficacy and self-esteem were associated with higher levels of financial threat. The absence of an analysis of this association prevents conclusions regarding its nature and the contribution to mental health. Vilhjálmsón, Sveinbjarnardóttir, and Kristjansdóttir (1998) investigated suicidal ideation in a general population sample from Finland. Their findings indicate associations between financial stress, self-esteem, locus of control, depression and anxiety, with suicidal ideation being associated with financial stress, low self-esteem and an externalised locus of control. However, satisfactory conclusions cannot be made about the nature or strength of these relationships as analysis focussed on their contribution to suicidal ideation and did not look at interaction effects. Weinstein and Stone (2018) looked at the impact of financial insecurity on wellbeing, via the effects of the satisfaction of the psychological needs of autonomy, competence and relatedness. They found that financial insecurity was related to both reduced satisfaction of these psychological needs and reduced wellbeing. They also found that not only was need satisfaction linked to increased wellbeing but that there was an indirect link such that the increased satisfaction of psychological need reduced the impact of financial insecurity on wellbeing.

Measures of psychological variables and mental health were predominantly validated and demonstrated satisfactory reliability in the studies investigating the influence of both self-esteem and personal agency. However, the design and analysis of financial hardship raised methodological issues across most of the studies, the exception being Weinstein and Stone (2018) who used a validated measure with demonstrated reliability in the study population. For the other studies, the use of limited numbers of questions (Lange & Byrd, 1998), or sufficient questions but no assessment of reliability within the sampled populations (Hughes et al., 2014; Marjanovic et al., 2015; Vilhjálmsón et al., 1998), raises uncertainty as to the validity of their findings. In addition, two of the studies (Hughes et al., 2014; Vilhjálmsón et al., 1998) did not utilise the potential value of the continuous data in analysis, either trichotomising or encoding scores into a dummy variable increasing the risk of bias in their results (MacCallum et al., 2002). Also, the use of a

composite wellbeing score and no separate analysis of the different psychological need dimensions by Weinstein and Stone (2018) reduces the ability to make specific conclusions about the impact of personal agency and self-esteem as distinct psychological factors. The analysis of confounding variables was also generally limited. Overall the methodological limitations of these studies do therefore raise questions about the value of the data pertaining to personal agency and self-esteem as co-existing psychological variables. In addition, the use of cross-sectional designs prevents conclusions regarding causality.

14. Managing difficulties

Six studies investigated how the relationship between financial hardship and mental health is influenced by an individual's ability to either actively apply strategies to support the management and resolution of difficulties experienced in life or to possess intrinsic strengths that enable the management of challenging life circumstances. These studies are summarised in Appendix D. Meyer and Lobao (2003) retrospectively analysed a large sample of data from one time point of the Ohio study, selected for its association with an economic farming crisis. Analysis of the use of different coping strategies indicated that withdrawal/denial and support seeking were significantly cross-sectionally associated with higher levels of depression, while active styles of coping were associated with reduced levels of depression. Nelson's (1989) longitudinal research with separated and married mothers suggests a potential protective role of coping on emotional well-being, suggesting that such skills may buffer against the negative effect of life strains in the short and long-term. These findings are supported by the study from Chou and Chi (2002), indicating that the negative impact of financial hardship on the life satisfaction of older adults in Hong Kong is reduced in those individuals employing greater selection and optimization of life management strategies.

Wadsworth et al. (2011) completed a randomized control trial based on extensive research into poverty and family-related stressors (e.g. Wolff, Santiago, & Wadsworth, 2009). The preventative program targeted poverty, with one area of the curriculum focussed on stress and coping skill training. Teaching skills for managing poverty stressors reduced financial concerns and the use of maladaptive coping strategies, and decreases in depression were predicted by the increased use of adaptive coping strategies. In comparison to these studies, research by Karademas and Roussi (2017) on individual and dyadic coping styles in Greek couples provides only limited support for the role of coping. They found that only in men did negative dyadic coping have a deleterious effect on distress in the context of financial strain, and its impact on relationship satisfaction. Renner, O'Dea, Sheehan, and Tebbutt (2015) sampled a large number of students, finding correlations between financial hardship and both psychological flexibility and distress. All three of these variables significantly contributed to a model explaining increased days out of role, but with no analysis of the interactions between them.

There was a wide variation in methodological quality of these studies. Causation cannot be attributed given the cross-sectional design of the majority of the studies (Chou & Chi, 2002; Karademas and Roussi, 2017; Meyer & Lobao, 2003; Renner et al., 2015). Generalisability of results is complicated by low or unreported response rates (Nelson, 1989; Renner et al., 2015). Though samples were generally representative of the population, monetary reward for participation and the removal of participants behaving inappropriately or lacking language skills, has possible consequences for compliance, attrition and therefore generalisability of the effectiveness of the intervention trialled in Wadsworth et al. (2011), as such incentives and actions may not be possible in standard delivery of an intervention. Overall the validity and reliability of the assessment of financial, psychological and mental health measures were inconsistent. A lack of clarity regarding the questions used and a single item used to assess financial hardship (Nelson, 1989; Renner et al., 2015); and the internal consistency of other measures was either not assessed or suggested questionable reliability (Chou & Chi, 2002; Meyer & Lobao, 2003).

15. Personality traits

Five studies explored the influence of personality traits on mental health outcomes in the context of financial difficulties. Studies of personality traits are summarised in Appendix E. Both [Handley et al. \(2013\)](#) and [Lee, Yip, Leung, and Chung \(2000\)](#) investigated the influence of neuroticism in suicidal ideation in rural communities and post-natal depression in Chinese women respectively. Though both studies demonstrated that neuroticism and financial difficulties predicted poorer mental health, these studies say little about how these variables interact with one another.

[Creed, Muller, and Machin's \(2001\)](#) study of people who were unemployed demonstrated that financial strain and neuroticism predict poor mental health. These factors were also significantly correlated with each other. Unfortunately, these relationships were not explored further so that no conclusions can be made as to the nature of their interactions. [Cole, Logan, and Walker \(2011\)](#) also evidenced a predictive effect of personality traits, with a reduced sense of self-control and financial difficulties associated with increased stress. Their finding also demonstrated associations between these variables in individuals accessing a substance abuse service. However, these correlations were also not explored in greater detail. In a longitudinal study, [Taylor et al. \(2012\)](#) looked at the role of optimism in parents of Mexican origin in the US. They found that optimism moderated the relationship between economic pressures and mood and anxiety symptoms. Thus high levels of optimism were associated with better mental health.

The conclusions that can be drawn from these studies about the relationships between the variables are limited, either by a cross-sectional design ([Cole et al., 2011](#); [Creed et al., 2001](#)) or a lack of analysis of variables' interactions ([Handley et al., 2013](#); [Lee et al., 2000](#)). Though all the studies demonstrated a significant predictive effect of both financial hardship and personality traits on mental health, and some showed associations between the variables, potential pathways and interaction effects were only explored in one study ([Taylor et al., 2012](#)). Low participation rates, high rates of attrition and samples unrepresentative of the general population also impact upon the extent to which the findings of these studies can be considered to be generalizable ([Creed et al., 2001](#); [Handley et al., 2013](#); [Lee et al., 2000](#)). Only one of the studies used standardised measures of financial hardship, personality traits and mental health, that demonstrated good reliability and validity ([Taylor et al., 2012](#)). In the remaining studies, scales were either inadequate, significantly altered or not assessed for their internal consistency within the samples, thus raising questions regarding either the validity or reliability of their assessment of these variables.

16. Other psychological variables

Five studies considered psychological variables unique to other studies. A summary of their findings is shown in Appendix F. The studies of [Braver, Gonzalez, Wolchik, and Sandler \(1989\)](#) and [Brown and Moran \(1997\)](#) sampled mothers in the context of marital status, looking at the effects of divorce in the US and changes in relationship status in the UK respectively. Negative economic events predicted psychological distress on the HCSSL ([Derogatis et al., 1974](#)) in [Braver et al. \(1989\)](#), and the psychological variable of interpersonal sensitivity was also elevated above norms. However, the nature of its effect in relation to financial hardship is not analysed. [Brown and Moran \(1997\)](#) longitudinally measured several non-psychological variables, as well as self-evaluation in the domains of personal attributes, competence and self-liking using the SESS (O'Connor & Brown, 1984). Their results indicated that financial hardship was associated with chronicity of depression and increased negative evaluations of the self. They proposed a model in which hardship creates a sense of humiliation and entrapment, which has negative consequences for self-evaluation and self-liking, leading to an increased vulnerability to depression.

[Hurwich-Reiss, Rienks, Bianco, Wadsworth, and Markman \(2015\)](#)

considered the influence of ethnic identity (EI) in an ethnically diverse sample of parents. Overall EI did not moderate the relationship between economic hardship and mental health. However, in African American fathers with strong EI, the association between hardship and distress was weaker.

In a longitudinal study, [Scanlon et al. \(2018\)](#) followed up participants from project DISRUPT ([Khan et al., 2015](#)), which also provided their baseline data. They examined the relationship between Executive Function (EF) and mental health in incarcerated African American men. The co-occurrence of depression and executive dysfunction was associated with increased food insecurity and difficulty paying bills. In contrast, impaired EF in those without depression was not associated with these hardship factors.

The impact of shame among people who were unemployed was explored cross-sectionally by [Creed and Muller \(2006\)](#). They found that shame and financial distress contributed significantly to a model of psychological distress. As additional analysis indicated there was no interaction effect, the authors concluded that they impacted independently on wellbeing, but could not establish what aspect of participants' experience shame arose from.

Conclusions regarding causation and generalisability from the study by [Braver et al. \(1989\)](#) are limited by the cross-sectional design and restricted diversity in the sample. In addition, the assessment of financial hardship has questionable validity and reliability, and confounding variables were not assessed, despite the potential importance of factors such as age and number of children.

[Brown and Moran \(1997\)](#) were the only researchers in this review to use an objective measure of financial hardship, rated by the interviewers. Ratings showed good inter-rater reliability, but raters may not have been fully blinded to life events that may be implicitly linked to financial difficulties. Women with any level of hardship were amalgamated into one group for analysis, perhaps providing an overly conservative assessment of the impact of economic difficulties. The [Scanlon et al. \(2018\)](#) study employed a longitudinal design, accounted for the effect of complex confounding factors and used standardised scales to measure mental health and psychological factors. However, they did not assess the reliability of these measures in the study population and questions pertaining to financial hardship were limited. As in other studies in this review, their choice to dichotomize scale scores raises questions over the validity of effect sizes given the loss of individual variation ([MacCallum et al., 2002](#)).

The [Creed and Muller \(2006\)](#) study comprehensively assessed the validity, reliability and independence of all the scales used, demonstrating acceptability in all domains. Causation is unclear given the cross-sectional design, and the lack of a satisfactory explanation of the relationship of shame to other factors leaves unanswered questions as to its role in the model identified. The cross-sectional design of the [Hurwich-Reiss et al. \(2015\)](#) study also prevents attributions regarding causation. Financial hardship was assessed with a valid and reliable measure, and ratings of economic hardship were similar across the groups allowing for more reliable comparison.

17. Multiple psychological variables

Five studies looked at a combination of psychological variables in relation to financial difficulties and mental health, which tended to be an assessment of general mental health or depression. A summary of their findings is shown in Appendix G. [Chen et al. \(2006\)](#) conducted a case-controlled psychological autopsy study comparing suicides in Hong Kong with age and gender-matched controls from the general population to establish risk and protective factors for suicide. The original data included assessment of the psychological variables of compulsivity, impulsivity and social problem solving, the latter two of which were included in the analysis by [Law, Yip, Zhang, and Caine \(2014\)](#). [Law et al. \(2014\)](#) retrospectively analysed a sample of the same data to explore these factors in the context of employment.

Table 2
Psychological variables associated with financial hardship and mental health.

Psychological Variables	
Global factor	Specific trait
Personal agency	Mastery Locus of control Self-efficacy Sense of coherence Autonomy Competence
Self-esteem	
Coping	Psychological flexibility Resilience Adaptive problem-solving skills
Personality traits	Neuroticism Impulsivity Compulsivity Optimism

Unmanageable debts, psychiatric illness and impulsivity were identified as risk factors for suicide in both the original sample and the sample of employed participants, but the interaction between these effects was not explored. Additionally, [Chen et al. \(2006\)](#) found that social problem-solving skills were a risk factor in the original sample.

[Hobfoll, Johnson, Ennis, and Jackson \(2003\)](#) conducted a longitudinal study looking at mastery and anger in the context of resource loss and depression in a sample of single women on low incomes living in inner cities. The study found that reductions in mastery and material resource were significantly associated with increased depression and anger, with mastery identified as the primary mediator between material loss and depression and anger. This finding is borne out by [Heilemann, Lee, and Kury \(2002\)](#) who also explored the effect of mastery, but in combination with resilience. Their cross-sectional analysis from a sample of women of Mexican descent found that inadequate financial resource was associated with depression, and mastery and resilience significantly explained the variance in depression scores. [Norvilitis, Szablicki, and Wilson \(2003\)](#) explored the influence of impulsivity and money attitudes on stress in students. Their findings suggest an association between perceived financial wellness and mental health. They also identified that wellness in mental health was associated with a more internal locus of control and lower levels of dysfunctional impulsivity. Associations were also found between stress and impulsivity and the tendency to use money to impress others.

The studies that investigated multiple psychological variables were predominantly cross-sectional in design, thus limiting conclusions about causation ([Chen et al., 2006](#); [Hobfoll et al., 2003](#); [Law et al., 2014](#); [Norvilitis et al., 2003](#)). The representativeness of the samples, and therefore generalisability of the findings, is questionable given the sampling methods and restricted nature of the populations chosen in most of the studies. The assessment and analysis of financial hardship in the majority of the studies lacked validity and reliability, given the use of single-item questions ([Chen et al., 2006](#); [Heilemann et al., 2002](#); [Law et al., 2014](#)), and the trichotomisation of scale scores ([Hobfoll et al., 2003](#)). The assessment of the internal consistency or reliability of ratings of mental health and the psychological variables was problematic in some of the studies ([Chen et al., 2006](#); [Law et al., 2014](#)), and trichotomisation of scale scores using arbitrary cut-offs potentially limits the usefulness of the information gained ([Hobfoll et al., 2003](#)). The remaining studies did, however, use standardised measures of all variables and assessed reliability ([Heilemann et al., 2002](#); [Norvilitis et al., 2003](#)). Somewhat surprisingly, although multiple psychological variables were assessed, there was limited analysis of their interactions and relationships with one another, giving little information as to the way these variables may influence one another and, in combination, impact upon mental health.

18. Discussion

This paper aimed to systematically review the literature which has explored the influence of psychological variables in the context of financial hardship and mental health, in order to establish which factors are most consistently and reliably implicated, and the mechanisms by which they operate. These factors have been considered in several studies, and this review, therefore, encompasses research of a variety of designs, conducted with a diverse range of populations from around the world. Psychological factors linked with mental health difficulties in the context of financial hardship are listed in [Table 2](#). Overall the studies in this review suggest that personal agency has an important role to play in the relationship between financial hardship and mental health. The evidence for the influence of mastery ([Heilemann et al., 2002](#); [Hughes et al., 2014](#)) is most compelling, as its mechanism of action is frequently demonstrated as mediatory ([Crowe & Butterworth, 2016](#); [Drentea & Reynolds, 2014](#); [Ennis et al., 2000](#); [Hobfoll et al., 2003](#); [Shteyn et al., 2003](#)). The value of increased autonomy and competence in protecting mental health supports this ([Weinstein & Stone, 2018](#)).

Locus of control would also appear to be an important variable in understanding hardship and mental health with a suggestion that having an internalised locus of control is associated with better mental health ([Krause, 1987](#); [Lange & Byrd, 1998](#); [Norvilitis et al., 2003](#); [Vilhjálmsdóttir et al., 1998](#)). However, there is also conflicting evidence of the significance of this relationship ([Jessop et al., 2005](#)). The role of personal agency is also indicated by evidence for an effect of self-efficacy ([Marjanovic et al., 2015](#); [Selenko & Batinic, 2011](#)) and Sense of Coherence ([Kivimäki et al., 2002](#); [Olsson & Hwang, 2008](#)), though with less clarity about the mechanism by which these forms of agency act. The studies of personal agency suggest that a sense of skill and control is important in ameliorating the detrimental effects of financial strain on mental health. There is potential overlap psychologically between the two variables of mastery and locus of control: If individuals feel they have the knowledge and skills to be able to make changes to their financial situation, then it follows that they may then feel they have more personal control over their finances.

The research exploring the impact of self-esteem alone is inconsistent but in the main indicates that there may be a protective effect of high self-esteem. The studies predominantly supported this notion ([Burdette et al., 2001](#); [Elahi et al., 2018](#); [Shim et al., 2017](#); [Wickrama et al., 2012](#)), though there was no consistent mechanism identified by which it had an action. The studies did, however, suggest that financial hardship had a detrimental impact on self-esteem, which in turn led to a higher risk of mental health difficulties. This is in line with studies showing that low self-esteem increases the risk of depression over time ([Sowislo & Orth, 2013](#)). Consequently, financial difficulties may be an important factor which reduces self-esteem and thereby increase vulnerability to poor mental health. The studies looking at both personal agency and self-esteem demonstrated that both factors impacted mental health in the context of financial hardship. It may be that low confidence in individuals' ability to make specific changes to their financial situations over time impacts confidence in broader areas of their life and reduces global self-esteem. However, methodological weaknesses in the measurement of financial hardship, and a lack of analysis of how agency and self-esteem interact, impact upon the conclusions that can be drawn.

The studies in this review also indicate that the ability to cope with and adapt to financial difficulties may be protective of mental health. Psychological flexibility ([Renner et al., 2015](#)) or resilience ([Heilemann et al., 2002](#)), or possessing adaptive problem-solving skills ([Chen et al., 2006](#); [Chou & Chi, 2002](#); [Meyer & Lobao, 2003](#); [Nelson, 1989](#)), may make challenging economic conditions easier to tolerate. Furthermore, [Wadsworth et al. \(2011\)](#) demonstrated that coping skills could be acquired through training, with positive consequences for mental health. Acceptance and Commitment Therapy (ACT) has been shown to be beneficial for mental health in deprived populations, and contextual behaviour science, which focuses on psychological flexibility, may have potential in contributing to reductions in poverty ([Thompson, 2015](#)).

Personality traits would also seem to be a relevant variable to understanding financial hardship and mental health. Neuroticism (Creed et al., 2001; Handley et al., 2013; Lee et al., 2000), poor self-control (Cole et al., 2011) and impulsivity (Chen et al., 2006; Law et al., 2014; Norvilitis et al., 2003) were identified as factors harmful to mental health in the context of financial difficulties. There is also evidence that optimism may protect mental health from the stressor of financial strain (Taylor et al., 2012). Though economic difficulties were also recognised as predictive factors, the analysis was largely restricted to considering them as parallel contributory factors rather than how personality and hardship may interact to influence mental health outcomes.

The review provides limited evidence for the negative impact of shame (Creed & Muller, 2006), executive dysfunction (Scanlon et al., 2018) and self-evaluation (Brown & Moran, 1997) on mental health in the context of economic challenges. Finally, studies exploring the effects of ethnic identity (Hurwich-Reiss et al., 2015) and interpersonal sensitivity (Braver et al., 1989) were inconclusive about their impact.

The breadth of the research reviewed provides support for the idea that the presence of certain psychological factors may have some benefit for mental health and well-being in the context of the experience of financial stress. As suggested by the stress buffer hypothesis (Wheaton, 1985), these factors act as a buffer preserving mental health and wellbeing despite the effects of financial stress. Sadly these papers also support the mechanism proposed by stress process theory (Pearlin et al., 1981) that these factors are vulnerable to depletion in response to stress, in which they stop acting as a buffer with negative consequences for mental wellbeing.

Fig. 2 proposes a model of the impact of the psychological factors with the most compelling evidence for their diminishing and protective effects upon mental health and wellbeing in response to financial hardship. This identifies that financial hardship worsens mental health and wellbeing by lowering self-esteem and reducing the sense of having personal agency over one's life. There is likely to be considerable overlap between these two variables as previously discussed. As well as increases in both self-esteem and personal agency being protective, the model also demonstrates that active coping strategies are also likely to mitigate the impact of financial hardship on wellbeing and mental health.

19. Limitations of the literature reviewed

The papers reviewed tended to be cross-sectional in design, limiting conclusions regarding causality. Though associations between financial hardship, mental health and a psychological variable may have been demonstrated, it cannot be known how these variables are interacting. Thus while variations in a psychological variable may be associated with the relationship between financial hardship and mental health difficulties, the specific causal role of these psychological variables is unclear. Risk of bias in the studies in this review may come from the deliberate oversampling of specific populations, such as women whose status is defined as single or people with disabilities; while the majority of studies sampled participants from communities known to be at risk of experiencing poverty or low-income. It is therefore difficult to say

whether the findings of these studies could be generalized outside of these populations. Though it is, of course, essential to understand how these disenfranchised groups may be suffering in times of hardship, there is a danger of neglecting other groups who, despite having higher incomes, may still be struggling to meet needs and expenses adequately. That the studies were almost exclusively conducted in countries classified as high-income countries (HICs), the only exception to this being one study conducted in Russia which is classified as a lower-middle-income country (LMIC), limits generalisations to populations in HICs.

The blinding of assessors is a limitation for many of the studies in this review. While those studies utilising online or paper surveys required no objective assessment of their experiences by a third party, the majority of studies used some form of one-to-one interview to complete the measures. In all but a small number of cases, interviewers would, therefore, have been aware of participants' financial situations and associated difficulties, which may have biased the completion of measures pertaining to psychological variables or mental health. There was much variation in the quality of assessment of financial hardship. Though standardised and validated measures were used in some studies, the assessment of financial hardship most frequently consisted of questions constructed by the author or based on pre-existing or previously used scales. While the use of self-ratings of financial hardship may introduce bias, this was partially ameliorated in studies which used comprehensive measures of economic strain as questions were related to the availability of tangible resources. Valid and/or reliable scales measuring hardship were consistent in the content of the questions asked, focussing on the presence of financial and material resource, and its sufficiency to meet their needs.

In contrast, a significant number of studies used only one question to measure financial difficulties, did not assess the internal consistency of the scales used, or dichotomised the measurements into a simple distinction between 'hardship' and 'no hardship'. All of these factors have consequences for validity and reliability, given the uncertainty that financial hardship is the construct being assessed, whether this assessment is accurate, and therefore if it is acceptable to compare what is defined as financial hardship across different studies. The studies in this review also predominantly used self-rated measures of mental health which may introduce bias. Furthermore, though they provide a good indicator as to global psychological distress, the frequent use of general measures of mental health reduces the conclusions that can be made as to what the nature of this distress is, and therefore the mechanisms by which psychological variables may influence it. Participation rates were frequently unclear or unreported, as was information describing when data was collected. Though many studies assessed a range of confounding variables, a significant proportion either made no assessment or were very limited in the confounds that were accounted for.

20. Limitations of review

The search of only two databases may be considered a limitation of the search strategy. Given that this review aimed to consider all papers investigating the influence of any psychological factor in the context of

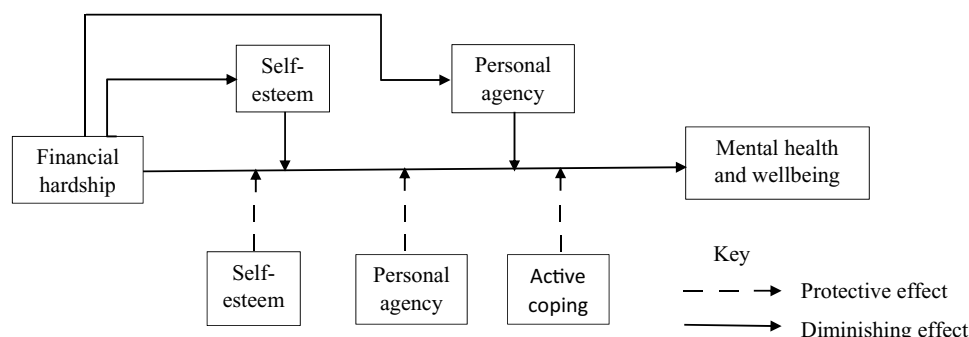


Fig. 2. Proposed model of influence of psychological factors on relationship between financial hardship and mental health.

mental health and financial hardship, a wide range of potentially relevant search terms could be used. The search terms used aimed to encompass all those frequently used in research about mental health and economic strain, but it is perhaps inevitable that some studies were missed given the wide variety of descriptions and labels applied to these experiences. In terms of the quality assessment, this is inherently limited by an individual completing this in isolation. Also, the tool itself was designed for cross-sectional and cohort studies. It was, therefore, perhaps unfairly applied to the two psychological autopsy studies and the randomized control trial. However, the consideration of bias concerning the methods used to measure the exposure variable and outcomes remains highly relevant. In relation to the RCT, the assessment tool may have insufficiently assessed potential bias outside of these key areas, especially when looking at procedure, analysis and the reporting of results.

21. Clinical implications

The identification of psychological factors that may protect mental health from the detrimental effects of financial hardship has wide-ranging clinical implications. While it remains of utmost importance to tackle and reduce the societal factors that increase vulnerability to the experience of financial hardship in individuals and communities, understanding who may be at greater risk of developing mental health difficulties in response to economic stress by assessing for the presence of identified risk factors may facilitate more rapid referral to financial interventions that alleviate this stressor. Furthermore, the possibility that enhancement of personal agency, self-esteem and coping skills may prevent or reduce mental health problems has exciting prospects for the development of coaching and training interventions that both empower and protect individuals from the effects of difficult contexts. O'Neill, Sorhaindo, Xiao, and Garman (2005) found that those who reported improved health following credit counselling were more likely to report changes such as developing a budgeting plan, cutting down on living expenses and following a budget. Thus such credit counselling may improve some of the variables identified in the articles reviewed and the proposed model, such as active coping and sense of personal agency. There may also be a role for peer support: Qualitative research suggests that personal support when going through a debt management programme increases confidence and self-esteem (Wang, 2010).

At a practical level, the development of active problem-solving skills could be facilitated through CBT: Both CBT and problem-solving therapy have been shown to reduce negative problem orientation, and such changes were linked to improvements in depression (Warmerdam, van Straten, Jongma, Twisk, & Cuijpers, 2010). Encouraging individuals to proactively engage with their difficulties in order to identify the content of their problem, with possible consequences for perceptions of the problem itself, and the advantages and disadvantages of possible solutions, enhances practical skills that may contribute to the resolution of difficulties while also having positive consequences for the sense of personal agency and empowerment in the face of challenging situations. CBT has also been found to increase self-esteem (Beattie & Beattie, 2018). Such an approach may be beneficial by specifically encouraging increased monitoring and appraisal of negative beliefs, be they about the self or their sense of responsibility for stressors and consequences over which they have minimal control. At an emotional level, the development of emotional coping skills, as taught in Dialectical Behaviour Therapy (Linehan, 2014), may allow individuals to regain some sense of control over their lives. Though control may be difficult to achieve on a financial level, feeling able to cope with the emotional consequences of these stressors may go some way to protect mental health.

The model described in Fig. 2 could be used as a way to understand why financial difficulties may have a different impact on wellbeing in different people. It could be used as part of a collaborative formulation in therapy to highlight target areas for therapy. Such a formulation could also be used to illustrate the impact of personal circumstances, thus normalising experiences and perhaps reducing feelings of self-blame and shame. It also identifies key factors for intervention to reduce the impact

of financial difficulties on mental health at a wider population level. For example, public health campaigns which openly discuss the impact of money problems on mental health may help people to feel less isolated with their financial problems; this may help increase their self-esteem and reduce the impact on depression. Providing information about support agencies around financial difficulties, and practical strategies to help with areas such as budgeting, may also improve a sense of personal agency about finances and lead to more active coping strategies which will, therefore, mitigate the impact on mental health.

22. Future directions

Future research in this area should aim to address some of the limitations identified in the existing literature. There is a need for more longitudinal studies to address issues of causation in how financial strain, mental health and psychological factors relate to and impact upon one another. Thus the mechanisms by which these factors interact need to be explored, and in more detail. Studies should also be utilising standardised measures of financial hardship which adequately measure the nature and severity of impact this stressor causes. More research is required to understand how relevant psychological factors interact with both financial hardship and mental health within specific demographics and populations, given that certain groups are likely to be more exposed and vulnerable to financial hardship, for instance, women, racial minorities, people who are unemployed and clinical populations. It is also essential to understand how the concept of financial hardship impacts in countries not classified as HIC.

23. Conclusions

While a number of psychological variables have been investigated for their impact on the relationship between financial hardship and mental health, the effect of personal agency, self-esteem and coping ability would seem to have the most compelling evidence in its favour. Studies demonstrating that feeling skilled and effective, and the ability to problem-solve and tolerate difficulties, have been conducted with a variety of populations, across different high-income countries of the world, and age groups across the life span, suggesting that such findings may generalise outside of these studies. The methodological quality of the research is variable; however, with causation and the valid and reliable measurement of financial hardship being areas of particular concern. These limitations should be addressed in future research.

Statement.

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Contributors

All authors designed the scope of the review and methodology for the search strategy. CF conducted the systematic search and a summarised the papers. All authors agreed on the final studies to be included. CF wrote the initial drafts of the systematic review. TR NM contributed to the editing of early versions of the manuscript. All authors have contributed to and approved the final version of the manuscript.

Declaration of interest

CF and NM have no conflicts of interest to declare. TR has presented about finances and mental health (not relating to this specific review) to a finance institution, a donation was made to charity for this. TR is also advising a private company about developing an intervention for financial problems and mental health, he is not currently paid for this but may be in the future.

Appendix A Studies of self-esteem.

Study	Design	Sample	Measures	Key findings	Confounds controlled for	Overall methodological quality rating
Burdette et al. (2011)	- Longitudinal - Retrospective	- 2402 Low-income women - USA	- BSI-18 - ACQ on household dispute and emotional support - RSES - Survey questions on FH (13 items) - FH question from WAS - Neighbourhood identity question from UK Community Life Survey (2015) - Single Item Self-Esteem Scale - Persecution subscale from PaDS - PHQ-9 - GAD-7	- Current household dispute positively associated with symptoms of psychological distress ($b = 0.04, p < .001$). - Emotional support and self-esteem don't explain the association between dispute and distress. - Self-esteem mediated the effect of financial stress on mental health symptoms. - Strong neighbourhood identification reduced the mediatory effect of self-esteem on the relationship between financial stress and mental health	Age, baseline psychological distress, city of residence, education, employment, marital status, no. of children, race/ethnicity and welfare.	Good
Elahi et al. (2018) (Study 1 only)	- Cross-sectional	- 4319 General Population - UK	- Survey questions on FH (13 items) - FH question from WAS - Neighbourhood identity question from UK Community Life Survey (2015) - Single Item Self-Esteem Scale - Persecution subscale from PaDS - PHQ-9 - GAD-7	- Self-esteem mediated the effect of financial stress on mental health symptoms. - Strong neighbourhood identification reduced the mediatory effect of self-esteem on the relationship between financial stress and mental health	age, sex, ethnicity, employment status, education level, level of neighbourhood deprivation	Poor
Gonzalez-Marin et al. (2018)	Cross-sectional	- 948 Unemployed people - Spain	- Self-rated health - GHQ-12 - ACQ on unemployment benefits and difficulty paying bills - DUKE social support index - RSES - ACQ on self-reported health, social support and intoxication - BSI - RSES - Survey questions on FH (13 items)	- Delay in paying bills [women: 1.17 (1.02–1.35); men: 1.45 (1.22–1.72)], self-esteem [women: 1.35 (1.19–1.53); men: 1.60 (1.36–1.89)], medium social support [women: 1.34 (1.18–1.52); men: 1.60 (1.36–1.89)] and low social support [women: 1.25 (1.08–1.46); men: 1.59 (1.33–1.89)] associated with poor mental health	Age, sex and social class	Poor
Hill et al. (2013)	Retrospective longitudinal	- 2402 Caregiving women - USA	- ACQ on self-reported health, social support and intoxication - BSI - RSES - Survey questions on FH (13 items)	- FH mediated effect of continuous marriage on psychological distress ($b = -0.10, p < .001$). - No mediatory effect of self-esteem	Age, education, employment, ethnicity, no. of children and welfare status.	Good
Ritter et al. (2000)	Prospective longitudinal	- 232 pregnant women - USA	- Shortened BDI - Measure of severity of depression symptoms from modified RDC Interview - SSQ-6 - ACQ on stressful life events, incl. FH (no. unknown) - RSES	- Decreases in depression predicted by less stress, satisfaction with social support and increased income ($\chi^2(83, N = 191) = 146.31, p < .001$). - Positive self-esteem not predictive of reduced depression. - Economic Stressors significantly ($p < .01$) contributed to the latent construct of Stressful life Events.	Age, education, family income, marital/romantic status and no. of children.	Fair
Shim et al. (2017)	Panel Study	- 1822 people from 911 married couples - Korea	- Survey questions on FH (13 items) and marital well-being - CES-D (11 items) - RSES	- Couples who experienced hardship tended to report higher depression and lower self-esteem. - Experiencing any material hardship was associated with lower levels of satisfaction of both family life and spousal relationship, consistently for husbands ($B = -0.35, p < .001$, and $B = -0.21, p < .05$, respectively) and wives ($B = -0.43, p < .001$, and $B = -0.38, p < .001$, respectively).	Age, income-to-needs ratio, the presence of dependent child under 18 years old, level of education attainment, employment status, urbanicity, self-rated health	Fair
Waters and Muller (2003)	Longitudinal	- Study 1 - 201 unemployed people	- FH question (1 item) - Study 1 - POMS – depression and	- Depression and self-esteem partially mediated the associations in both groups. Study 1: - Financial deprivation ($\beta = 0.12$) and deprivation of time structure ($\beta = 0.39$) significantly predicted psychological distress – consisting of anxiety ($\beta = 0.83$),	None	Poor

- Study 2 anxiety subscales
- Global self-worth subscale
- Financial deprivation not a significant predictor at follow-up.
- Study 2:
 - Financial deprivation ($\beta = 0.35$) and deprivation of time structure ($\beta = -0.44$) significantly predicted psychological distress consisting of anxiety ($\beta = 0.85$), depression ($\beta = 0.83$) and self-esteem ($\beta = -0.57$) - at baseline
 - At 6 month follow-up 28% of variance in distress explained by time structure ($t(68) = 2.56, p < .05$) and financial deprivation ($t(68) = -5.24, p < .05$).
 - Relationship between financial deprivation and distress not significant at 12 month follow up.
 - Chronic FH influences depression via self-esteem in husbands ($\chi^2 (14 df) = 24.84$) and wives ($\chi^2 (14 df) = 26.8$).
 - Self-esteem and depression in husbands and wives forms a mutually reciprocal process, initiated by early financial hardship ($\chi^2 (50 df) = 74.66$).
 - Economic hardship has a greater impact on husband's self-esteem.

Wickrama et al. (2012)

- Prospective longitudinal
- 370 husbands and wives
- Rural areas
- ACQ on Family FH (27 items)
- RSES
- SCL-90 - depressive symptomatology subscale

Education and gender

Good

Abbreviations: ACQ = Author Constructed Questions; BDI = Beck Depression Inventory; BSI = Brief Symptom Inventory; FH = Financial Hardship; GAD = Generalized Anxiety Disorder; GHQ = General Health Questionnaire; PaDS = Persecution and Deservedness Scale; POMS = Profile of Mood States; PHQ = Patient Health Questionnaire; RSES = Rosenberg's Self-Esteem Scale; SCL-90 = Symptom Checklist; SCS = Self-Control Scale; WAS = Work, Attitudes and Spending Survey.

Appendix B Studies of personal agency

Study	Design	Sample	Measures	Key findings	Confounds controlled for	Overall methodological quality rating
Crowe and Buttrworth (2016)	Retrospective Cohort	- 2404 general population - Australia	- Goldberg Depression Scale - Pearlin's Mastery Scale - Survey questions on FH (4 items) and Social Support	- Significant ($p < .05$) relationship between Unemployment and Depression (OR = 1.55). - Association mediated by: Financial Hardship (OR = 1.87) and Mastery (OR = 4.05). - Financial Hardship accounted for 28% and 17% of the relationship between Depression and Unemployment and Underemployment respectively. - The association between 'part-time but looking for full-time' and mental health was fully mediated by financial hardship and mastery. - Financial hardship explained 18% of the difference in the prevalence of poor mental health for the unemployed and 33% of the difference for the 'part-time, but looking for full-time'.	Age, dependent children, education, gender, marital status and physical health.	Fair
Crowe et al. (2016)	Panel study	- 9382 working adults aged 20-34 - Australia	- MHI-5 - Pearlin's Mastery Scale - survey questions on FH (7 items), perceived social support and employment status	- The inclusion of mastery accounted for 12% and 21% of the association of poor mental health for the unemployed and 'part-time, but looking for full-time' respectively. - Economic Hardship and Debt are independent risk factors for mental health problems. - Economic Hardship has a significantly greater impact on mental health than debt. - Mastery significantly mediates the relationship between Economic Hardship and Depression ($b = -4.423, p < .001$), Anxiety ($b = -0.911, p < .001$) and Anger ($b = -1.155, p < .001$), accounting for 38%, 28% and 33% of the association respectively.	Employment status, age, marital status, education, gender, and physical health	Fair
Drentea and Reynolds (2014)	Panel study	- 1463 general population - Oversampling of people with disabilities - USA	- CES-D - State Anxiety Inventory - "How I Feel" Instrument (Anger) - ACQ on FH (4 items), debts, assets and social support, and home ownership and value - Pearlin and Schooler Mastery Scale	- Material loss related to greater depressive mood in African Americans ($\beta = 0.298, p < .001$) and European Americans ($\beta = 0.316, p < .001$). - In African Americans and European Americans, Mastery ($\beta = -0.336, p < .001$) and $\beta = -0.347, p < .001$ respectively) is associated with less depressive mood. - Resources have stress buffering effects on depressive mood when loss	Age, disability, education, employment, gender, health insurance coverage, marital status, no. of children, physical disability, race/ethnicity and prior mental and physical health.	Good
Ennis et al. (2000)	Cross-sectional	- 1241 Single, low-income women - USA	- POMS depression scale, short form - SSQ-6 - Pearlin and Schooler Mastery Scale	- Material loss related to greater depressive mood in African Americans ($\beta = 0.298, p < .001$) and European Americans ($\beta = 0.316, p < .001$). - In African Americans and European Americans, Mastery ($\beta = -0.336, p < .001$) and $\beta = -0.347, p < .001$ respectively) is associated with less depressive mood. - Resources have stress buffering effects on depressive mood when loss	Age, education, employment, ethnicity, no. of children and pregnancy.	Good

Jessop et al. (2005)	Cross-sectional	- Students - 89 British - 98 Finnish	- Conservation of Resources Evaluation - ACQ on debt, financial concern (6 items), smoking and alcohol consumption, work - SF-36 - Internal-External Locus of Control Scale	occurs: greater effect of social support for African Americans ($\beta = -0.116, p < .01$) and mastery for European Americans ($\beta = -0.101, p < .001$). - Poor health predicted by financial concern rather than amount of debt. - Financial concern significantly predicted greater role limitation due to emotional problems ($F_{change}(1, 150) = 16.13, p < .001$) and worse mental health ($F_{change}(1, 151) = 33.95, p < .001$). - External locus of control associated with worse perceptions of health - No mediatory effect of locus of control on relationship between financial concerns and health perceptions - In men: Psychological problems (anxiety, mental distress and lowered sense of coherence) and health-risk behaviours partially mediate the relationship between life stressors (violence and financial difficulties) and sickness absence. - Men more vulnerable to the impact of stressful life events. - In women: Stressful life events related to psychological distress (anxiety, mental distress and lowered sense of coherence), but not work absence through sickness.	Age, alcohol use, gender, hours worked and smoking.	Fair
Kivimäki et al. (2002)	Retrospective Cohort	- 796 Men - 2195 Women - Permanent municipal employees of eight towns - Finland	- Survey questions on stressful life events, incl. FH (3 items), and tobacco and alcohol consumption - Anxiety-trait scale - GHQ-12 - Antonovsky's short Orientation to Life Questionnaire - Sickness absence from employee records	- In men: Psychological problems (anxiety, mental distress and lowered sense of coherence) and health-risk behaviours partially mediate the relationship between life stressors (violence and financial difficulties) and sickness absence. - Men more vulnerable to the impact of stressful life events. - In women: Stressful life events related to psychological distress (anxiety, mental distress and lowered sense of coherence), but not work absence through sickness.	Age and gender.	Good
Krause (1987)	Panel study	- 351 retirees - aged over 65 - non-institutionalised - USA	- CES-D - FH questions (4 items, Pearlman et al., 1981) - Rotter's Internal-External Locus of Control Scale (7 item version)	- Financial strain significantly impacts later depressive symptoms ($\beta = 0.192, p < .05$). - Baseline depression does not impact later financial strain. - Baseline financial strain significantly impacts later financial strain ($\beta = 0.406, p < .001$). - Locus of control reduces the impact of financial strain on depression ($b = -0.032, p < .05$). - Effects of chronic financial strain on depression greater for those with external control orientations ($b = 0.345, p < .001$).	Age, education, gender and marital status.	Good
Olsson and Hwang (2008)	Cross-sectional	- 62 Mothers/49 Fathers of children with Intellectual Disabilities - 183 Mothers/141 Fathers control parents - Sweden	- BDI-2r - ACQ on FH (13 items) and satisfaction with work, leisure and social activities - FIQ - Antonovsky Short Orientation to Life Questionnaire	- Mothers of children with ID have lower levels of well-being compared to fathers and control parents - Differences in FH ($\beta = 0.17, p < .001$) predicted well-being. - Sense of coherence (mothers ($\beta = -0.64, p < .01$) and fathers ($\beta = -0.32, p < .07$)) associated with better mental health in context of hardship.	Age of child, education years, income, no. of children and single parent status.	Fair
Selenko and Batinic (2011)	Cross-sectional	- 106 debt counselling clients - Austria	- ACQ on perceived financial strain (6 items) - GHQ-12 - Access to Categories of Experience Scale - GSES	- Perceived financial strain negatively correlated with Mental Health ($r(106) = -0.54, p < .001$). - Amount of debt not correlated with Mental Health or perceived financial strain. - Only perceived financial strain was related to Mental Health, accounting for 26.8% of variance ($F(1, 102) = 41.10, p < .001$). - The effect of financial strain was moderated by self-efficacy, social contacts and collective purpose.	Education and gender.	Fair
Shiteyn et al. (2003)	Cross-sectional	- 198 women - Employed as medical or retail workers - Russia	- Conservation of Resources Evaluation: material and financial subscales - Pearlman's Mastery Scale - SSQ-6 - State-Anger scale of the State-Trait Anger Expression Inventory - CES-D	- Economic loss associated with a negative impacted on mastery, but not social support. - Women with greater mastery and social support resources reported less psychological distress. - Economic loss had both direct and indirect effects, through mastery, on women's psychological distress. ($x2 = 5.90 (10, N = 145), p > .10$)	None	Fair

Abbreviations: ACQ = Author Constructed Questions; BDI = Beck Depression Inventory; CES-D = Centre for Epidemiologic Studies Depression Scale; FH = Financial Hardship; FIQ = Family Impact Questionnaire; GHQ = General Health Questionnaire; GSES = General Self-Efficacy Scale; MHI = Mental Health Inventory; OR = Odds Ratio; POMS = Profile of Mood States; SF-36 = Short Form 36 Health Survey; SSQ = Social Support Questionnaire; STAI = State Trait Anxiety Inventory.

Appendix C Studies investigating personal agency and self-esteem together

Study	Design	Sample	Measures	Key findings	Confounds controlled for	Overall methodological quality rating
Hughes et al. (2014)	Cross-sectional	- 3570 African Americans - USA	- CES-D – 12 item - ACQ on FH (9 items), social identity and social relationships - RSES - The Mastery Scale	- Racial identity associated with reduced impact of financial stress on depressive symptoms, through positive group evaluations ($b = -1.09, p < .05$). - Racial identity associated with reduced impact of financial stress on psychological resources, especially self-esteem. - Mastery and self-esteem explain 26–46% of how racial identity weakens the association between financial stress and mental health - Psychological well-being related to perceptions of financial situation. - Path analysis: - Current debt and daily financial stress affect sense of being able to manage finances ($0.193, p < .05$). - Perceived level of future debt and chronic financial strain related to the ability to understand financial situation ($-0.173, p < .05$). - Self-esteem ($0.410, p < .01$) and Locus of Control (internal ($0.604, p < .01$) and chance ($-0.353, p < .01$)) related to comprehensibility of finances. - Anxiety related to internal locus of control ($-0.632, p < .01$). - Depressed affect related to internal locus of control ($-0.592, p < .01$) and self-esteem ($-0.617, p < .01$). - Higher levels of financial threat associated with tendency to worry, low self-efficacy and low self-esteem. - The relationship between financial situation and wellbeing is partially mediated by perceptions of financial threat.	Age, education, gender, income and marital/partner status.	Fair
Lange and Byrd (1998)	Cross-sectional	- 237 Students - New Zealand	- ACQ on FH (2 items) and current and future debt - HCSL - Antonovsky's short Orientation to Life Questionnaire - Economic Locus of Control Scale - Self-Esteem Inventory	- Financial insecurity linked to lower overall psychological need satisfaction, $b = -0.28, 95\% \text{ CI} = -0.36, -0.20, t(223) = -7.04, p < .001$. - Financial insecurity linked to lower well-being, $b = -0.44, 95\% \text{ CI} = -0.53, -0.35, t(223) = -9.39, p < .001, pr = -0.53, d = -1.25$. - Need satisfaction linked to higher well-being, $b = 0.89, 95\% \text{ CI} = 0.79, 0.99, t(222) = 17.52, p < .001, pr = 0.76, d = 2.32$. - Indirect effect linking financial insecurity to well-being through need satisfaction, $b = -0.276, se = 0.044, 95\% \text{ CI} [-0.368, -0.194]$.	None	Fair
Marijanovic et al. (2015)	Cross-sectional	- Cross-cultural - General Population - 275 Belgium - 78 Germany - 231 Portugal - 222 Spain - 825 general population - Iceland	- FTS - ICS - EHQ - JIS - PSWQ - GSES - RSES - MBI-GS - GHQ-12	- ACQ on life stress (incl. Financial stress – 9 items), perceived stress, shyness, alcohol use, chronic illness, pain, hopelessness, loneliness - SEQ - RSES - Rotter Locus of Control Scale – short form - SCL-90 – depression and anxiety scales - Personal Financial Wellness Scale - Basic psychological need scale (24-item) - STAI - CES-D (10-item) - RSES - Well-being composite - ACQ on financial cheating	Age, education, employment, gender, marital status and personal income in the previous year.	Fair
Vilhjálmsdóttir et al. (1998)	Cross-sectional - Retrospective	- 228 online workers - US	- Rotter Locus of Control Scale – short form - Personal Financial Wellness Scale - Basic psychological need scale (24-item) - STAI - CES-D (10-item) - RSES - Well-being composite - ACQ on financial cheating	- Financial insecurity linked to lower overall psychological need satisfaction, $b = -0.28, 95\% \text{ CI} = -0.36, -0.20, t(223) = -7.04, p < .001$. - Financial insecurity linked to lower well-being, $b = -0.44, 95\% \text{ CI} = -0.53, -0.35, t(223) = -9.39, p < .001, pr = -0.53, d = -1.25$. - Need satisfaction linked to higher well-being, $b = 0.89, 95\% \text{ CI} = 0.79, 0.99, t(222) = 17.52, p < .001, pr = 0.76, d = 2.32$. - Indirect effect linking financial insecurity to well-being through need satisfaction, $b = -0.276, se = 0.044, 95\% \text{ CI} [-0.368, -0.194]$.	Age, education and gender	Fair

Abbreviations: ACQ = Author Constructed Questions; CES-D = Centre for Epidemiologic Studies Depression Scale; EHQ = Economic Hardship Questionnaire; FH = Financial Hardship; FTS = Financial Threat Scale; GHQ = General Health Questionnaire; GSES = General Self-Efficacy Scale; HCSL = Hopkins Symptom Checklist; ICS = Income Change Scale; JIS = Job Insecurity Scale; MBI-GS = Maslach Burnout Inventory – General Survey; PSWQ = Penn State Worry Questionnaire; RSES = Rosenberg's Self-Esteem Scale; SCL-90 = Symptom Checklist; SEQ = Support Exchange Questionnaire.

Appendix D Studies of managing difficulties

Study	Design	Sample	Measures	Key findings	Confounds controlled for	Overall methodological quality rating
Chou and Chi (2002)	Cross-sectional	- 420 general population - aged over 60 - Hong Kong	- LSI-A (Chinese version) - ACQ on FH (4 items) - SOC questionnaire (Chinese version)	- LSI-A scores were significantly associated with age, marital status, financial strain, selection of SOC, optimization of SOC, and compensation of SOC. - Financial strain ($b = -0.40, p < .01$) was a stronger predictor of life satisfaction than both age and marital status ($b = -0.12, p < .05; b = 0.14, p < .05$). - The impact of financial strain on LSI-A scores was lower when respondents had higher levels of selection of SOC or optimization of SOC than with lower levels of selection of SOC or optimization of SOC. - Material loss in men was associated with their distress directly, as well as indirectly through their negative dyadic coping. - Threat of loss in men was related to own distress through their negative dyadic coping.	Age, gender, marital status and education	Fair
Karademas & Roussi (2016)	Cross-sectional	- 236 people from 118 heterosexual relationships - Greece	- Conservation of Resources Evaluation: material resource items - DCI - Relationship Assessment Scale - GHQ-12	- Women's psychological distress was associated with neither own nor partner's reports of material loss, threat of loss, or dyadic coping. - Subjective ratings of economic hardship were strongly related to depression and stress. - Sense of mastery over challenges associated with negative impact on stress and depression. - Personal characteristics, social support and effective coping skills had a small effect on improving mental health outcomes.	None	Good
Meyer and Lobao (2003)	Cross-sectional	- Farmers - 531 Men - 497 Women - USA	- ACQ on stress - CES-D - Debt-asset ratio - Validated FH questions (3 items) - Control of farm problems scale - Religious affiliation - Emotional Well-Being Scale	- Life strains are inversely related to emotional well-being. - Coping can buffer the negative impact of life strains on well-being. - Separated women are at a higher risk for emotional problems than married women ($F(1,80) = 4.56, p < .05$), due to greater financial concerns ($F(1,76) = 4.03, p < .05$).	Age, education, health and religious affiliation.	Fair
Nelson (1989)	Prospective longitudinal	- 30 Separated Mothers - 60 Married Mothers - Canada	- Modified Coping Strategies and Resources Inventory - Modified CPC, incl. Financial Concerns Subscale - ACQ on Positive and Negative Changes - ACQ on FH (1 item) - AUDIT - K10 - AAQ-II - EHQ - CES-D - The Coping Efficacy Measure - The Communication Skills Test - Problem Solving - Responses to Stress Questionnaire	- Life strains are inversely related to emotional well-being. - Coping can buffer the negative impact of life strains on well-being. - Separated women are at a higher risk for emotional problems than married women ($F(1,80) = 4.56, p < .05$), due to greater financial concerns ($F(1,76) = 4.03, p < .05$).	Income level and marital status.	Fair
Renner et al. (2015)	Cross-sectional	- 3950 students - Australia	- ACQ on FH (1 item) - AUDIT - K10 - AAQ-II - EHQ - CES-D - The Coping Efficacy Measure - The Communication Skills Test - Problem Solving - Responses to Stress Questionnaire	Days out of role significantly and independently associated with: - economic hardship ($\beta = 0.09, p < .001$) - increased psychological distress ($\beta = 0.32, p < .001$) - less psychological flexibility ($\beta = 0.16, p < .001$) Teaching skills for managing poverty-related stress led to: - reductions in financial worries, disengagement coping and involuntary disengagement - increases in primary control coping and problem solving. Decreases in depressive symptoms predicted by: - increased coping - decreased financial stress and involuntary engagement stress responses.	Age, attendance, first person in family to attend university, gender, language background, level of study, relationship status, student type and travel time. Gender and pre-intervention depression	Fair Good
Wadsworth et al. (2011)	Randomized Control Trial	- 173 couples with at least one child - USA	- AAQ-II - EHQ - CES-D - The Coping Efficacy Measure - The Communication Skills Test - Problem Solving - Responses to Stress Questionnaire	Days out of role significantly and independently associated with: - economic hardship ($\beta = 0.09, p < .001$) - increased psychological distress ($\beta = 0.32, p < .001$) - less psychological flexibility ($\beta = 0.16, p < .001$) Teaching skills for managing poverty-related stress led to: - reductions in financial worries, disengagement coping and involuntary disengagement - increases in primary control coping and problem solving. Decreases in depressive symptoms predicted by: - increased coping - decreased financial stress and involuntary engagement stress responses.	Age, attendance, first person in family to attend university, gender, language background, level of study, relationship status, student type and travel time. Gender and pre-intervention depression	Fair Good

Abbreviations: AAQ-II = Acceptance and Action Questionnaire; ACQ = Author Constructed Questions; AUDIT = Alcohol Use Disorders Identification Test; CES-D = Centre for Epidemiologic Studies Depression Scale; CPC = Checklist of Problems and Concerns; DCI = Dyadic Coping Inventory; EHQ = Economic Hardship Questionnaire; FH = Financial Hardship; GHQ = General Health Questionnaire; K10 = Kessler Psychological Distress Scale; LSI-A = Life Satisfaction Index-A; SOC = Selection, Optimization and Compensation.

Appendix E Studies of personality traits

Study	Design	Sample	Measures	Key findings	Confounds controlled for	Overall methodological quality rating
Cole et al. (2011)	Cross-sectional	- 787 Substance abuse service users - USA	- PSS - Perceived discrimination scale - ACQ on FH (8 items), subjective social standing, personal control, substance abuse and social support - Brief SCS - GHQ-12 - Eysenck Personality Questionnaire Revised – neuroticism scale - FH questions (4 items, Ullah, 1990) - Survey questions on suicidal ideation, perceived FH (1 item) and concerns about infrastructure and services - K10 - AUDIT - Berkman Syme Social Network Index - ISSI – Availability of Attachment Scale - Sense of Community Index - 12 Item Eysenck Scale – brief form (for neuroticism)	Perceived stress significantly ($p < .001$) related to: - financial hardship ($\beta = 0.182$) - perceived control over life ($\beta = -0.217$) - self-control ($\beta = -0.324$). - These factors contributed to 57% of the variance in perceived stress. Psychological distress predicted by: - Financial strain ($\beta = 0.32$, $p < .01$) - Neuroticism ($\beta = 0.43$, $p < .001$) - Psychological Distress significantly associated with ($OR = 1.30$, $p < .001$) and predictive of ($OR = 1.16$, $p < .001$) suicidal ideation. - Neuroticism significantly associated with ($OR = 1.15$, $p < .005$) and predictive of ($OR = 1.17$, $p = .013$) suicidal ideation. - Financial difficulties significantly associated with suicidal ideation ($OR = 6.72$, $p < .001$), but not predictive of.	Age, alcohol use, days incarcerated, drug use, education, employment, gender, income, physical health, race and satisfaction with social support.	Fair
Creed et al. (2001)	Cross-sectional	- 81 unemployed people - Australia	- GHQ-12 - Eysenck Personality Questionnaire Revised – neuroticism scale - FH questions (4 items, Ullah, 1990) - Survey questions on suicidal ideation, perceived FH (1 item) and concerns about infrastructure and services - K10 - AUDIT - Berkman Syme Social Network Index - ISSI – Availability of Attachment Scale - Sense of Community Index - 12 Item Eysenck Scale – brief form (for neuroticism)	Psychological distress predicted by: - Financial strain ($\beta = 0.32$, $p < .01$) - Neuroticism ($\beta = 0.43$, $p < .001$) - Psychological Distress significantly associated with ($OR = 1.30$, $p < .001$) and predictive of ($OR = 1.16$, $p < .001$) suicidal ideation. - Neuroticism significantly associated with ($OR = 1.15$, $p < .005$) and predictive of ($OR = 1.17$, $p = .013$) suicidal ideation. - Financial difficulties significantly associated with suicidal ideation ($OR = 6.72$, $p < .001$), but not predictive of.	Age and gender.	Fair
Handley et al. (2013)	Longitudinal	- 2639 general population - Rural and remote areas - Australia	- GHQ-12 - Eysenck Personality Questionnaire Revised – neuroticism scale - FH questions (4 items, Ullah, 1990) - Survey questions on suicidal ideation, perceived FH (1 item) and concerns about infrastructure and services - K10 - AUDIT - Berkman Syme Social Network Index - ISSI – Availability of Attachment Scale - Sense of Community Index - 12 Item Eysenck Scale – brief form (for neuroticism)	Psychological Distress significantly associated with ($OR = 1.30$, $p < .001$) and predictive of ($OR = 1.16$, $p < .001$) suicidal ideation. - Neuroticism significantly associated with ($OR = 1.15$, $p < .005$) and predictive of ($OR = 1.17$, $p = .013$) suicidal ideation. - Financial difficulties significantly associated with suicidal ideation ($OR = 6.72$, $p < .001$), but not predictive of.	Baseline suicidal ideation, employment, gender and study phase.	Fair
Lee et al. (2000)	Prospective longitudinal	- 220 Post-partum Chinese women - Hong Kong	- BDI - GHQ-30 - SCID-NP - Eysenck Personality Questionnaire – Neuroticism subscale - Medical Outcome Study Social Support Survey - Life Event Scale - ACQ on FH (no. unknown), marital relationship and past depressive episodes - Survey questions on household structure, family routine, maternal monitoring, educational involvement, peer competence, school attachment and teacher attachment - ACQ on FH (17 items) - LOT-R - Mini Mood and Anxiety Symptom Questionnaire (general depression, anhedonic depression and general distress/anxiety) - Behavioural Affect Rating Scale	Postnatal depression associated with: - Financial difficulties ($OR = 3.4$) - Neuroticism ($OR = 1.3$) - Optimism moderated the relation between economic pressure and internalizing symptoms. - The effect of economic pressure on internalizing symptoms was weak and nonsignificant ($\beta = 0.08$, $z = 1.06$, ns) when optimism was high, moderately positive ($\beta = 0.25$, $z = 4.08$, $p < .001$) at the mean level of optimism, and strongly positive ($\beta = 0.42$, $z = 3.95$, $p < .001$) when optimism was low. - Economic pressure was associated with higher levels of internalizing symptoms ($r = 0.37$, $p < .01$).	None	Poor
Taylor et al. (2012)	Retrospective longitudinal	- 674 parents of Mexican origin (549 from 2 parent families, 125 single parents) - US	- ACQ on FH (no. unknown), marital relationship and past depressive episodes - Survey questions on household structure, family routine, maternal monitoring, educational involvement, peer competence, school attachment and teacher attachment - ACQ on FH (17 items) - LOT-R - Mini Mood and Anxiety Symptom Questionnaire (general depression, anhedonic depression and general distress/anxiety) - Behavioural Affect Rating Scale	Optimism moderated the relation between economic pressure and internalizing symptoms. - The effect of economic pressure on internalizing symptoms was weak and nonsignificant ($\beta = 0.08$, $z = 1.06$, ns) when optimism was high, moderately positive ($\beta = 0.25$, $z = 4.08$, $p < .001$) at the mean level of optimism, and strongly positive ($\beta = 0.42$, $z = 3.95$, $p < .001$) when optimism was low. - Economic pressure was associated with higher levels of internalizing symptoms ($r = 0.37$, $p < .01$).	Mother's education in years, mother's age, mother's years in the US and gender of child	Fair

Abbreviations: ACQ = Author Constructed Questions; AUDIT = Alcohol Use Disorders Identification Test; BDI = Beck Depression Inventory; BSI = Brief Symptom Inventory; CES-D = Centre for Epidemiologic Studies Depression Scale; FH = Financial Hardship; GAD = Generalized Anxiety Disorder; GHQ = General Health Questionnaire; ISSI = Interview Schedule for Social Interaction; K10 = Kessler Psychological Distress Scale; LOT-R = Life Orientation Test; OR = Odds Ratio; PSS = Perceived Stress Scale; SCID-NP = Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders, non-patient version; SCS = Self-Control Scale.

Appendix F Studies of other psychological factors

Study	Design	Sample	Measures	Key findings	Confounds controlled for	Overall methodological quality rating
Braver et al. (1989) Brown and Moran (1997)	Cross-sectional Longitudinal	- 77 Mothers - USA - 404 Mothers - UK	- HGSL - ACQ on FH (4 items) and Income - Shortened PSE - Self-Evaluation and Social Support Schedule - Life Events and Difficulties Schedule - Childhood Experience of Care and Abuse Schedule - FH Objectively rated by researcher	- Drop In Income and Negative Economic Events significant predictors of Psychological Distress. Risk of depression onset: - Almost double among women in FH ($p = .001$). - FH associated with chronicity of depression. - Negative evaluations of self ($p < .01$, $df = 2$), lack of a 'true' Very Close Other ($p < .001$, $df = 2$) and Childhood Adversity (χ^2 trend, $p < .02$, $df = 1$) more common in those experiencing FH. - Shame, Psychological Distress and Financial Strain more prevalent among the unemployed ($F(8,243) = 38.59$, $p < .001$). - Financial Distress ($\beta = 0.28$, $p < .001$) and Shame ($\beta = 0.16$, $p < .05$) contributed significantly to a model of Psychological distress which accounted for 32.4% of variance. - No support for an interaction between Financial Distress and Shame. - FH associated with increased emotional distress in all ethnicities ($\chi^2(3) = 1.08$, $p = .36$, CFI = 1.00, RMSEA = 0.02). - In African Americans, stronger ethnic identity associated with reduced emotional stress ($\beta = -0.267$, $p < .01$). - Ethnic identity did not moderate the relationship between economic hardship and emotional distress.	None Employment and marital status.	Fair Good
Creed and Muller (2006)	Cross-sectional	- 125 unemployed people - 133 full-time workers - Australia	- GHQ-12 - Latent and Manifest Benefits Scale (six subscales: time structure, social support, collective purpose, status, activity and financial distress - 10-item Shame scale		Age, employment and gender.	Fair
Hurwich-Reiss et al. (2015)	Cross-sectional	- 123 African Americans - 134 European Americans - 98 Latinos - Parents in long-term relationships - USA	- MEIM - EHQ - BSI - PCRI		Ethnicity and gender	Fair
Scanlon et al. (2018)	Cross-sectional Retrospective	- 189 incarcerated African Americans - USA	- WCST - CES-D - State-Trait Anxiety Inventory - SCID to measure APSD - Borderline Evaluation of Severity Over Time Scale (5 item version, Scheidel et al., 2016) - ACQ on stress pre-incarceration - Survey questions on FH (2 items), employment status and lifetime substance use - Multidimensional Scale of Perceived Social Support	Impaired EF and depression strongly associated with: - pre-incarceration food insecurity (AOR = 3.81, 95% CI [1.35, 10.77]) - homelessness (OR = 3.00, 95% CI [1.02, 8.80]) - concern about bills (OR = 3.76, 95% CI [1.42, 9.95]) - Those with high levels of depression but who had intact EF also had higher odds than those with no depressive symptoms and intact EF to report food insecurity (AOR = 3.59, 95% CI [1.47, 8.75]) and concern about the ability to pay bills (AOR = 3.22, 95% CI [1.42, 7.27]) in the 6 months before incarceration.	Age, ASPD diagnosis, stress score, BPD symptom severity score and educational attainment	Poor

Abbreviations: ACQ = Author Constructed Questions; ASPD = Antisocial Personality Disorder; BPD = Borderline Personality Disorder; BSI = Brief Symptom Inventory; CES-D = Centre for Epidemiologic Studies Depression Scale; EF = Executive Function; EHQ = Economic Hardship Questionnaire; FH = Financial Hardship; GHQ = General Health Questionnaire; HGSL = Hopkins Symptom Checklist; MEIM = Multigroup Ethnic Identity Measure; PCRI = Parent-Child Relationship Inventory; PSE = Present State Examination; SCID = Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders; WCST = Wisconsin Card Sorting Test.

Appendix G Studies of multiple psychological factors

Study	Design	Sample	Measures	Key findings	Confounds controlled for	Overall methodological quality rating
Chen et al. (2006)	- Psychological Autopsy - Case controlled	- 150 suicide completers - 150 controls - Hong Kong	- Circumstances of death - ACQ on income, financial situation (1 item), social support, life event variables and healthy living styles - LEE - CTS-2 - SCID-1 - IRS - Compulsivity instrument - SPSI	Significant (all $p < .001$) independent contributors to suicide: - unemployment (OR = 9.40) - debt (OR = 8.03) - psychiatric diagnosis (OR = 37.55) - impulsivity (OR = 5.45) - social problem-solving skills (OR = 0.46)	Age, gender, method of suicide and unemployment	Fair
Heilmann et al. (2002)	Cross-sectional	- 315 Women - Mexican descent - USA	- Resilience Scale - Pearlman & Schooler Mastery scale - CES-D - ACQ on external resource variables (incl. 1 item on FH) and intrinsic strength variables	- Women reporting inadequate financial resources had significantly ($p < .001$) higher CES-D scores ($M = 20.5$, $SD = 11.6$) than women with adequate resources ($M = 14.9$, $SD = 10$). - Mastery ($\beta = -0.340$, $p < .001$), Life Satisfaction ($\beta = -0.323$, $p < .001$) and Resilience ($\beta = -0.203$, $p < .001$) accounted for 31% of the variance in CES-D scores.	Acculturation, education level and marital/partner status.	Fair
Hobfoll et al. (2003)	Prospective longitudinal	- 714 Inner-city women - USA	- POMS depression scale, short form - SSQ-6 - Pearlman and Schooler Mastery Scale - STAXI, State version - Conservation of Resources Evaluation	- Changes in mastery significantly associated with changes in emotional distress ($F(4, 1406) = 17.961$, $p < .049$). - Increased material loss increased anger and depressed mood ($F(4, 1388) = 6.476$, $p < .000$). - Loss of mastery, social support and material resource has a larger impact on distress than the gain of these resources.	Age, anger, education and initial depressive mood.	Good
Law et al. (2014)	- Psychological Autopsy - Case controlled - Retrospective	- 63 suicide completers - 112 controls - Employed - Hong Kong	- Circumstances of death - Survey questions on income, financial situation (1 item), social support, life event variables and healthy living styles - LEE - CTS-2 - SCID-1 - IRS - Compulsivity instrument - SPSI	- Mastery is the prime mediator between material loss and depressive mood/anger. - Suicide in employed workers significantly associated with: - psychiatric illness (OR = 25.88, $p < .001$) - unmanageable debts (OR = 7.25, $p = .032$) - impulsivity (OR = 5.15, $p = .013$) No significant contribution made to the model by social problem-solving ability	Psychiatric background	Poor
Norvilitis et al. (2003)	Cross-sectional	- 227 students - USA	- ACQ on credit card use - Student Financial Well-Being Scale - MAS - Dickman Functional and Dysfunctional Impulsivity Scales - SWLS - DASS - Stress subscale - Internal-External Locus of Control Scale	- Debt to income ratio related to the perceived financial well-being scale ($r = -0.29$, $p < .01$), but not money attitude and personality variables. - Perceived financial well-being associated with psychological well-being, lower levels of dysfunctional impulsivity and a more internal locus of control	None	Fair

Abbreviations: ACQ = Author Constructed Questions; CES-D = Centre for Epidemiologic Studies Depression Scale; CTS-2 = Revised Conflict Tactics Scales; DASS = Depression Anxiety Stress Scale; FH = Financial Hardship; IRS = Impulsivity Rating Scale; LEE = Level of Expressed Emotions; MAS = Money Attitude Scale; OR = Odds Ratio; POMS = Profile of Mood States; SCID-1 = Structured Clinical Interview for DSM-IV-TR Axis-I Disorders; SPSI = Social Problem Solving Inventory; SSQ = Social Support Questionnaire; STAXI = State-Trait Expression Inventory; SWLS = The Satisfaction With Life Scale.

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