Life satisfaction of older people living in sheltered housing

Emotional distress mediates the relationship between cognitive failures, dysfunctional coping and life satisfaction in older people living in sheltered housing:

A structural equation modelling approach

Phuong Leung[1], Vasiliki Orgeta[1], Amina Musa[2] & Martin Orrell[3]

University College London, UK

[1]Division of Psychiatry, University College London, UK

[2] Hillingdon Children and Young People Social Services

[3] Institute of Mental Health, University of Nottingham, UK

Dr Phuong Leung
University College London
Division of Psychiatry
6th Floor, Maple House,
149 Tottenham Court Road,
London W1T 7NF

0044-020-7679-9023 (voice)
0044-020-7679-9426 (fax)
phuong.leung@ucl.ac.uk

Life satisfaction of older people living in sheltered housing

Abstract

Objectives: Little is known about the relationship between cognitive failures, emotional distress and life satisfaction in late life. Experiencing cognitive failures is a known risk for declining life satisfaction in older people, though the mechanisms that may explain cognitive failures remain unclear. This study investigated the associations between psychosocial factors, cognitive failures and coping strategies and their influence on life satisfaction in older people living in sheltered housing.

Methods: A total of 204 older people living in sheltered housing in London were recruited (mean age = 75.08 years). We used structural equation modelling path analysis test several hypotheses based on theories of emotional distress (anxiety and depression) and cognitive failures and their influence on life satisfaction.

Results: Self-reported depressive symptoms (29.5%), anxiety symptoms (33%) and cognitive failures (41%) were common. The final model had a good fit (X^2 =2.67; DF=2; P=0.26; NFI=.99, CFI=.99; RMSEA=0.04); analyses showed that both cognitive failures and dysfunctional coping were significantly associated and exerted a moderate effect on emotional distress. Cognitive failures and dysfunctional coping had an indirect effect on life satisfaction through emotional distress which directly decreased levels of life satisfaction (β=-.70, p≤0.001).

Conclusions: This study found that experiencing emotional distress helped to explain the association and negative effects of cognitive failures and dysfunctional coping on life satisfaction in older people living in sheltered housing. These findings contribute to our understanding of the key mechanisms of experiencing cognitive failures in late life and can help guide future interventions of well-being in later life.

Key words: older people living in sheltered housing; life satisfaction; anxiety, depression, emotional distress; cognitive failures; dysfunctional coping.

Introduction

Life satisfaction of older people living in sheltered housing

Sheltered housing is purposed built accommodation providing a safe environment and greater independence for older people no longer able to live independently at their own home (Croucher et al., 2008; van Bilsen et al., 2008; Vlachantoni et al., 2016). Older people move into sheltered housing due to a range of factors such as bereavement, loss of a partner, declining physical health or poor housing conditions (Kingston et al., 2001; van Bilsen et al., 2008; Vlachantoni et al., 2016). Studies have shown that older people living in sheltered accommodation are more vulnerable than older people living independently in the community; they have lower life expectancy, and generally require more support and resources from general practitioners and health services (Vlachantoni et al., 2016).

The term quality of life (QoL) has been broadly defined as the combination of physical and psychological health experienced by individuals incorporating social support and economic status (Montgomery, 2010). Life satisfaction refers to subjective feelings of happiness and contentment regarding life and is therefore considered an important outcome of QoL (Medvedev & Landhuis, 2018). Depression and anxiety are common in late life and are associated with considerable morbidity and decreased life satisfaction in older people (Canuto et al., 2017; Sivertsen et al., 2015). There are currently mixed findings in relation to prevalence of depression in older people living in sheltered housing. Walker and colleagues (1998) for example found that prevalence of depression is generally lower in these settings compared to older adults living independently in the community; prevalence of depression in the community was 18.6% in those living alone and 11.3% in those living with others whereas in the sheltered group rates were around 10.7% with most living alone. This finding is in contrast to studies reporting that prevalence rates of depression in sheltered housing schemes may be higher (24%) in comparison to older people living in the community (Field, Walker, & Orrell, 2002). Although anxiety and depressive symptoms are distinctive syndromes, they are highly correlated (Bjelland, Dahl, Haug, & Neckelmann, 2002) with approximately 85% of people with depression also experiencing symptoms of anxiety and vice versa (Gorman, 1996). Anxiety is highly comorbid with depression in older people and is

Life satisfaction of older people living in sheltered housing

associated with experiencing a higher rate of cognitive failures (Wolitzky-Taylor et al., 2010; Zlatar et al., 2014).

Cognitive failures are minor errors or slips in cognition such as failures to notice street names or forgetting appointments that can disrupt daily tasks and functioning (Pfeifer et al., 2009). Cognitive complaints are also a major source of concern for older people (Kessler, Bowen, Baer, Froelich, & Wahl, 2012); with mixed evidence as to whether they increase risk of cognitive decline and clinical Alzheimer's disease (Coley et al., 2008). Studies show that even mild cognitive complaints can decrease life satisfaction in late life (Jones et al., 2003). Older people that are exposed to stressful events are at increased risk of experiencing cognitive failures (Broadbent et al., 1982) posing them more vulnerable to symptoms of anxiety and depression (Bauermeister & Bunce, 2015; Bridger et al., 2013). Older people experiencing emotional distress are more vulnerable to cognitive failures (Bridger, Johnsen, & Brasher, 2013); which influences their coping strategies and perceptions of quality of life (Verhaeghen et al., 2000; Holahan et al., 2005).

Despite increasing research examining cognitive complaints and their impact on daily cognitive function (Bridger, Johnsen, & Brasher, 2013; Carrigan & Barkus, 2016), there is limited research investigating the association between cognitive failures, emotional distress, coping strategies and quality of life outcomes as well as the potential mechanisms explaining this relationship in older people without cognitive decline. This study investigated the associations between psychosocial factors, cognitive failures and coping strategies that may influence life satisfaction in older people living in sheltered housing. Our hypothesis was that higher levels of health status, perceived social support and life satisfaction will be associated with lower levels of emotional distress, cognitive failures and use of dysfunctional coping. We further explored the association between emotional distress (anxiety and depression) and cognitive failures and their influence on life satisfaction.

Method
Participants

Life satisfaction of older people living in sheltered housing

The present study was a cross sectional survey. We recruited older people living in sheltered housing schemes across London that were run by housing associations and local authorities. We included participants that were ≥ 55 years, able to understand and complete all questionnaires and able to provide informed consent. Exclusion criteria were tenants with severe cognitive impairment or lack of capacity. We obtained ethical approval from the University College London (UCL) Research Ethics Committee.

Measures

Life Satisfaction

The Philadelphia Geriatric Center Morale Scale (PGCMS; Lawton, 2001) was used to measure morale, and psychological well-being as important determinants of quality of life (Pinar & Oz, 2011); the measure comprises 17 questions with a higher score indicative of higher levels of life satisfaction (Lawton, 2001). In the present sample, internal consistency of the PGCMS was $\alpha \geq$ 0.88.

Emotional distress

We used the Hospital and Anxiety Depression Scale (HADS; Zigmond and Snaith, 1983) to measure emotional distress. Anxiety and Depression subscales correlate highly and are frequently analysed as a single scale (Bjelland et al, 2002). Each subscale ranges from 0 to 21 with scores categorised as: normal 0-7, mild 8-10, and moderate to severe 11-21 (Michopoulos et al., 2008). Scores for the entire scale (emotional distress) range from 0 to 42, with higher scores indicating higher levels of emotional distress. A total HADS score of 15 or more is considered as a case of experiencing clinically significant emotional distress (Ibbotson et al., 1994). The HADS total demonstrated an $\alpha \geq .85$.

Cognitive failures

The Cognitive Failures Questionnaire (CFQ) (Broadbent et al., 1982) was used to assess self-reported cognitive failures. The CFQ is a 25-item self-rating questionnaire designed to measure

everyday cognitive failures (Wallace et al., 2002); it comprises 4 subcategories which are loss of activation, false triggering, failure to trigger and unintended activation (Meiran et al., 1994; Flehmig et al., 2007). CFQ scores range from to 0 to 100, with higher scores indicative of a higher incidence of cognitive failures. The scale showed excellent internal consistency ($\alpha \geq 0.95$).

Coping

The Brief-Cope (B-Cope) is a 28 self-completed questionnaire measuring coping strategies, comprising of 14 subscales which are further divided into three subscales; problem-focused, emotion-focused and dysfunctional coping (Carver, Scheier, & Weintraub, 1989). Higher scores are indicative of greater use of strategies. In the present study, all scales showed an $\alpha \geq 0.91$.

Health status

The EQ-5D Visual Analogue Scale (VAS) (Euro, 2005; EuroQol, 1990) was used to measure self-rated health status (Rabin & de Charro, 2001; Whynes, 2008). Participants rated their current health status on a scale of 0 to 100, where higher scores were indicative of better health. The EQ-5D VAS shows strong correlations with well-established measures of physical and mental health such as the Short Form-12 Health Survey (Johnson & Coons, 1998).

Social support

Perceived social support was assessed with the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988). The MSPSS is a 12-item scale measuring three sources of support; support from family, friends and significant others. Previous studies show that the MSPSS demonstrates excellent psychometric properties (Kazarian & McCabe, 1991). In the present sample, the measure demonstrated an $\alpha \geq 0.95$.

Statistical analysis

Firstly, we used Pearson correlations to test the associations between the psychosocial variables; cognitive failures, emotional distress; perceived social support; and coping strategies; life satisfaction was the primary outcome. Secondly, we performed a structural equation modelling

Life satisfaction of older people living in sheltered housing

(SEM) path analysis (Arbuckle & Wothke 2005) to test several hypotheses based on theories of emotional distress (anxiety and depression) and cognitive failures and their influence on life satisfaction.

Data was analysed by SPSS and Analysis of a Moment Structures (AMOS) 22.0. Several goodness-of-fit indices are commonly used to evaluate how well the structural model fits the data. This should result in a non-significant chi-square that suggests a 'good' fit. The root mean square error of approximation (RMSEA) (Steiger & Lind, 1980) was used to assess a fit model in the application of SEM (Jackson, Gillaspy, & Purc-Stephenson, 2009; Kelley & Lai, 2011). RMSEA≤0.05 refers to a close fit to the model (Browne & Cudeck, 1992; MacCallum, Browne, & Sugawara, 1996); normal fit index is (NFI) ≥ .90 and comparative fit index is (CFI) ≥.90. We employed comparisons of nested models (models that are subsets of one another) in order to achieve a good-fitting model (MacCallum, Browne, & Sugawara, 1996; Satorra & Saris 1985).

Results

Demographics: A total of 204 participants comprised the current sample with a mean age of 75.1 years (SD = 8.73) of which 114 (56%) were females. Most participants 152 (74.5%) were White European, 33 (16.2%) were Black, 10 (4.9%) were Asian, 5 (5.2%) were mixed, 3 (1.5%) were Chinese and 1 (0.5%) Other. A total of 148 (72.5%) of the sample lived on their own, 19 (9.3%) lived with their spouse, 12 (5.9%) lived with other family or friends, and 25 (12.3%) lived with friends. A total of 103 (50.0%) participants finished school during the age of 14-17, 57 (28%) at the age of 18 years, and 44 (22%) completed further education.

Emotional distress and experience of cognitive failures; A total of 33% (67) of older people experienced anxiety symptoms (mild - 16%; moderate - 13%; severe - 4%); 29.5% (60) experienced depressive symptoms (mild - 15%; moderate - 13% and severe 1.5%). A total of 66 (32%) participants reported experiencing cognitive failures occasionally and 18 (9%) reported experiencing these quite often to very often.

Life satisfaction of older people living in sheltered housing

Initial analyses: Table 1 shows Pearson correlation coefficients of all variables which included emotional distress, cognitive failures, dysfunctional coping, health status, perceived social support and the outcome measure of life satisfaction. Both anxiety and depression were negatively correlated with life satisfaction, and emotional distress (measured by HADS Total) was significantly associated with life satisfaction (R=-.70, P≤.01). Perceived social support had a small but significant association with life satisfaction (R=.28, P≤ .01); high levels of life satisfaction were associated with better health status (R=.52, P≤ .01), a lower incidence of cognitive failures (R=-.34, P≤ .01) and less use of dysfunctional coping (R=-.37, P≤ .01). Problem-focused coping and emotion focused coping were not associated with life satisfaction (R=-.08, P≥.05; R=-.09, P≥.05)

Structural equation modelling (SEM)

Path analysis

The first mediation model was developed based on theoretical and empirical evidence of the relationship between life satisfaction, emotional distress (anxiety and depression), and cognitive failures (Wolitzky-Taylor et al., 2010; Zlatar et al., 2014). The path diagram mediation A, including standardised regression coefficients, is shown in Figure 1. The model fit indices demonstrated a poor fit with X² =129.7, DF=5, P=0.00, NFI=.73, CFI=.73, RMSEA=0.35. Since there was no significant direct and indirect path between anxiety, depression, dysfunctional coping, cognitive failures and life satisfaction, the second mediation model B was nested within mediation model A to achieve a good-fitting model by having fewer parameters; health status, perceived social support were removed since they were not significantly associated with life satisfaction. Results showed that mediation model B yielded a poor fit across indices with X² =109.2, DF=3, P=0.00, NFI=.70, CFI=.70, RMSEA=0.42 (Figure 2).

The third mediation model C was developed based on previous theory and evidence on life satisfaction in late life (Bauermeister & Bunce, 2015; Bridger et al., 2013); the insignificant mediation model C indicated X² =83.51, DF=5, P=0.001, NFI=.83, CFI=.83, RMSEA=0.28 and is presented in Figure 3. Therefore, the fourth mediation model D was nested within model C by

having fewer of the manifested variables. This reduced model was used to achieve a good-fitting model; where anxiety and depression (as potential mediators) were combined into one score (HADS total; emotional distress) (Bjelland, Dahl, Haug, & Neckelmann, 2002). As a result, mediation model D yielded a satisfactory fit across indices with X^2 =2.67, DF=2, p=0.26, NFI=.99, CFI=.99, RMSEA=0.04. This final estimated mediation model alongside standardised path coefficients is presented in Figure 4. Analyses revealed that when cognitive failures and dysfunctional coping were included in the model, only emotional distress remained as a significant mediator decreasing life satisfaction (β=-.70; p≤0.001). Cognitive failures were significantly associated with use of dysfunctional coping (R=.31, P≤0.001) and directly influenced emotional distress (β=.35, p≤0.001).

Discussion

Cognitive failures are a well-recognised risk factor for decreased life satisfaction in older people however the mechanisms for this relationship remain poorly understood. Our study found that emotional distress and cognitive failures were common in this sample of older people living in sheltered housing. Our results show that even occasional experiences of cognitive failures may have a significant psychological effect for older people (Broadbent et al., 1982; Gates et al., 2014; Zlatar et al., 2014) by decreasing their life satisfaction (Jones et al., 2003). Using path analysis, we were able to investigate the associations between emotional distress, cognitive failures and coping strategies and their influence on life satisfaction in older people. The findings from this cross-sectional study extend current literature by showing that emotional distress mediates the relationship between cognitive failures, dysfunctional coping and life satisfaction in late life.

We found that life satisfaction did not vary according to participants' characteristics such as age, gender, ethnicity, living arrangement or education. Older people reporting lower levels of life satisfaction experienced higher levels of emotional distress and cognitive failures (Verhaeghen et al., 2000) and were more likely to use dysfunctional coping (Holahan et al., 2005; Verhaeghen et al., 2000; Zautra & Wrabetz, 1991). This suggests that older people who are at increased risk of emotional distress are more susceptible to experiencing cognitive complaints (Bauermeister &

Bunce, 2015) and therefore more likely to use dysfunctional coping strategies such as denial or expressing negative feelings as a way of coping with cognitive failures (Carver, Scheier, & Weintraub, 1989; Cooper et al., 2008).

Our results indicate that the association between cognitive failures and dysfunctional coping indirectly influenced life satisfaction. Although those reporting higher levels of perceived health status and social support experienced greater life satisfaction, these variables did not influence life satisfaction in our final model. We also found no association between life satisfaction, and problem-focused and emotion-focused coping strategies.

Our mediation analysis showed a mechanism of one direction path analysis where two independent variables; cognitive failures and dysfunctional coping, were interrelated and indirectly influenced life satisfaction through emotional distress (mediator). This finding suggests that cognitive failures experienced by older people are associated with specific psychological mechanisms and may therefore not be 'purely' cognitive.

Our findings also showed that people experiencing cognitive failures were more likely to use dysfunctional coping and experienced higher levels of emotional distress (Kimura et al., 2015). Anxiety and depression are highly inter-correlated (Bjelland et al., 2002; Das-Munshi et al., 2008) and their comorbidity increases emotional distress (Wolitzky-Taylor, et al., 2010) thereby decreasing life satisfaction (Canuto et al., 2017; Sivertsen et al., 2015). In contrast, cognitive failures did not mediate the association between emotional distress and dysfunctional coping and life satisfaction.

In line with previous studies (Field et al., 2002), we found a high rate of mild and moderate anxiety symptoms (29%) and equally high levels of mild and moderate symptoms of depression (28%) in older people living in sheltered housing similar to community samples (Livingston et al., 1990; Walker et al., 1998). We found that 32% of the sample reported occasional cognitive failures and 9% reported these as occurring quite often to very often. The CFQ gives respondents the opportunity to assess their own memory and everyday function (Flehmig et al., 2007; Meiran et al.,

1994) which differs from standardised objective measures of cognition such as the Mini Mental State Examination (MMSE) (Folstein, Folstein, & McHugh, 1975). Taken together, our results indicate that interventions that target emotional distress may help attenuate experience of cognitive failures in older people and may be used as preventative strategies.

Limitations and directions for future research

Despite the lack of common method variance, the use of self-report questionnaires is likely to have produced a social desirability bias effect (Bowling, 2007). Although there was some variability in relation to ethnicity, most of the sample was White British; generalisation therefore is limited. Given that we recruited older people living in urban settings the extent to which our findings could be generalised to rural populations is unknown. We did not measure income which has an important influence on perceptions of life satisfaction (Jones et al., 2003) and it is possible that some people recruited in our study may had undiagnosed early dementia. In the absence of longitudinal data in this study, the findings do not confirm the causality or prediction between the variables studied. Our results therefore need to be considered with caution given the cross-sectional design of our study. Longitudinal research is needed to fully explore the relationship between life satisfaction, cognitive complaints, emotional distress and coping strategies.

Conclusion

This study found that experiencing emotional distress helped to explain the association and negative effects of cognitive failures and dysfunctional coping on life satisfaction in older people living in sheltered housing. Emotional distress played a small, but significant mediating role in the overall reduction of life satisfaction. Our findings extend previous research on psychosocial factors influencing life satisfaction in late life and the potential role of experiencing cognitive failures. Given the cross-sectional nature of our results further longitudinal studies should be conducted to replicate these findings. Future research should investigate how interventions enhancing cognition and use of positive coping strategies may prevent emotional distress and increase life satisfaction in older people.

Life satisfaction of older people living in sheltered housing

Key points

- Experiencing cognitive failures was associated with emotional distress

- Older people reporting cognitive failures are more likely to use dysfunctional coping strategies

- The association between cognitive failures and dysfunctional coping directly increase emotional distress and indirectly lower life satisfaction

- Cognitive failures did not mediate the association between emotional distress and dysfunctional coping and life satisfaction

Authors' contributions

PL and VO prepared the manuscript. PL and AM recruited participants and PL analysed the data gathered. PL, VO, AM and MO were involved in the development of the design and methodology of the study. All authors reviewed and commented on drafts of the manuscript, revising it critically for important intellectual content, read and approved the final manuscript for publication.

Correspondence concerning this article should be addressed to Dr. Phuong Leung, University College London, Division of Psychiatry, 6th Floor, Maple House, 149 Tottenham Court Road, London W1T 7NF. E-mail: Phuong.leung@ucl.ac.uk.

Life satisfaction of older people living in sheltered housing

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Table 1 Correlations of psychosocial variables

	PGCMS	HADS-A	HADS-D	HADS Total	CFQ	P-coping	E-coping	D-Coping	EQ5-D VAS	MSPSS
PGCMS	1	-.63**	-.64**	-.70**	-.34**	-.08	-.09	-.37**	.52**	.28**
HADS-A		1	.71**	.92**	.40**	-.07	-.08	.43**	-.41**	-.26**
HADS-D			1	.89**	.39**	-.01	.03	.37**	-.53**	-.35**
HADS Total				1	.45**	-.03	.07	.44**	-.51**	-.31**
CFQ					1	.08	.02	.31**	-.22	-.08
P-coping						1	.84**	.54**	.02	.17*
E- coping							1	.56**	.01	.17
D-coping								1	-.17*	-.09
EQ5-D VAS									1	.09
MSPSS										1

Note: PGCMS, Philadelphia Geriatric Center Morale Scale; HADS total, Anxiety, Hospital and Anxiety Depression Scale; EQ5-D VAS, Health state; CFQ, Cognitive Failures Questionnaire; P-coping, problem-focused coping;
E-coping, emotion-focused coping; D-coping, dysfunctional coping; MSPSS, Multidimensional Scale of Perceived Social Support
** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed)

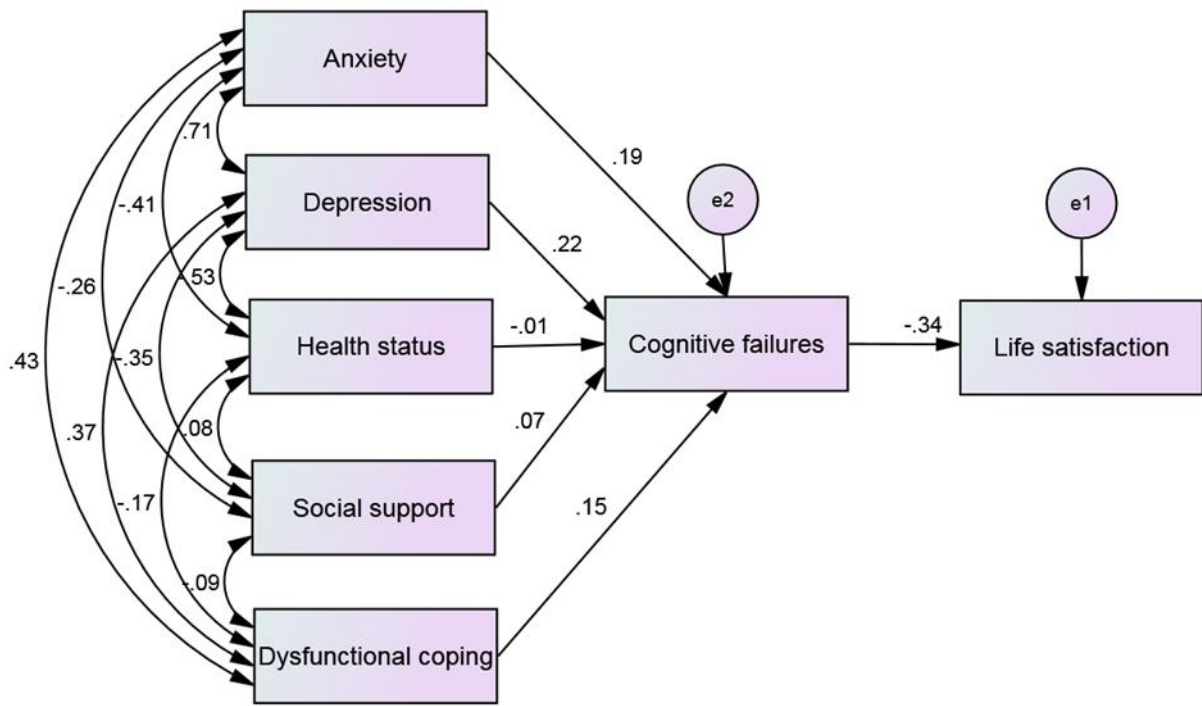Life satisfaction of older people living in sheltered housing

Figure 1. Mediation model A
X²=Chi square, DF=Degree of freedom, NFI= Normal fit index, CFI=comparative fit index and RMSEA = Root Mean Square Error of Approximation.

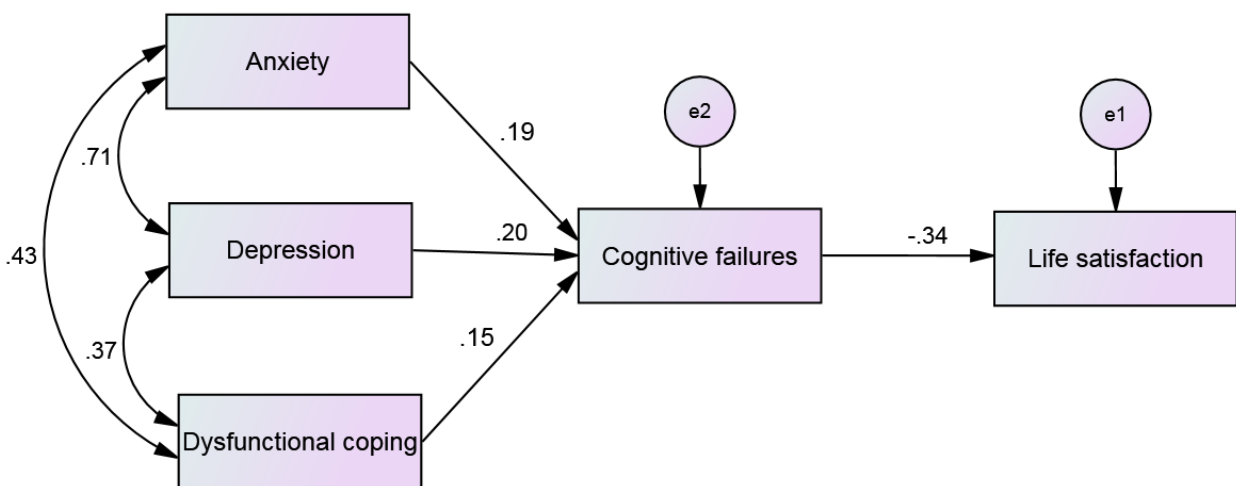X² =83.51, DF=5, P=0.001, NFI=.83, CFI=.83, RMSEA=0.28.

Figure 2. Mediation model B
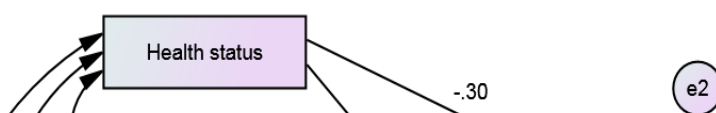
X² =109.2, DF=3, P=0.00, NFI=.70, CFI=.70, RMSEA=0.42

Figure 3. Mediation model C
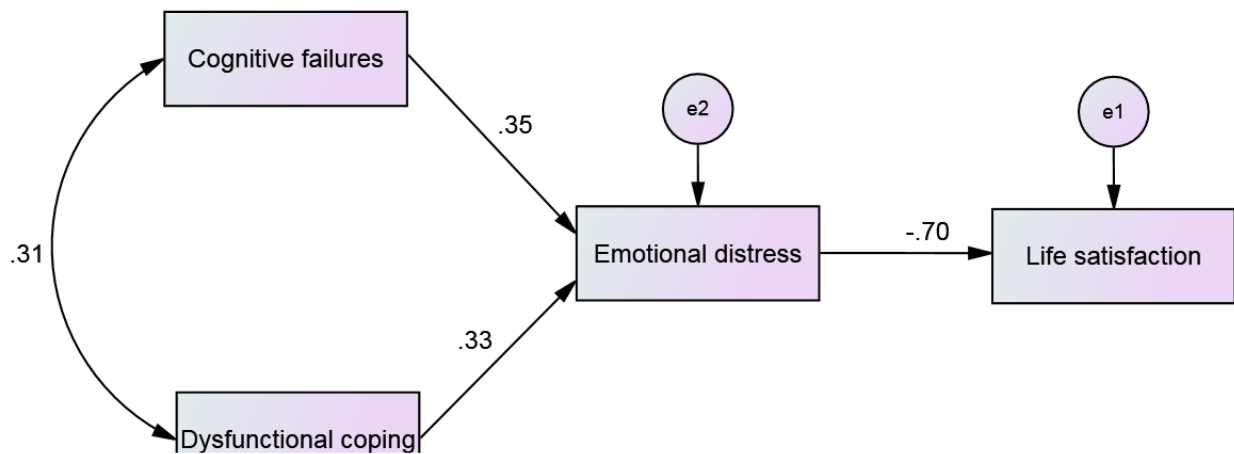
X² =129.7, DF=5, P=0.00, NFI=.73, CFI=.73, RMSEA=0.35

Figure 4. Mediation model D
X² =2.67, DF=2, p=0.26, NFI=.99, CFI=.99, RMSEA=0.04
Standardised regression weight between dysfunctional coping and emotional distress (anxiety and depression) (β=.33, P≤.001); cognitive failures and emotional distress (β=35, P≤.001); emotional distress and life satisfaction (β= -.70, P≤ .001)