

The interaction effect of gender and residential environment, individual resources, and needs satisfaction on quality of life among older adults in the UK

Dr Ben Chi-pun Liu, PhD

Senior Lecturer in Social Work, School of Health and Social Work, University of Hertfordshire, United Kingdom

Dion Sik-yee Leung, DHSc (C.)

Senior Lecturer in Nursing, School of Health Sciences, Caritas Institute of Higher Education, Hong Kong

Dr Julia Warrener, PhD

Deputy Dean, School of Health and Social Work, University of Hertfordshire, United Kingdom

Abstract

Objectives: To examine the difference in gender and its impact on selected quality of life (QoL) domains of Social Production Function Theory among older adults in England. **Methods:** Based on an annual national adult social care service user survey conducted in the UK in 2016. QoL was assessed by a single-item construct and independent variables were home design, access to information and local area, self-rated health, perceived pain/discomfort, perceived anxiety/depression, activities of daily living, use and satisfaction of formal and informal care, and demographic variables. **Results:** 28,955 respondents aged 65+ were interviewed. Multinomial logistic regression analysis found four interaction effects for predicting a very good/good QoL: (1) Female receiving non-co-residing informal care (OR=1.501, $p<.01$), (2) Female feeling safe (OR=1.499, $p<.01$), (3) Female feeling satisfied with social contact with people (OR=1.465, $p<.05$), and (4) Female being helped in the use of time (OR=1.370, $p<.05$). **Conclusion:** Findings suggest gender differences in QoL as men and women are heterogenous with different health and disease patterns, health-/help-seeking behaviours, roles and responsibilities, and levels of resilience, needs, risks, and access and control resources. Practitioners should adopt a gender-specific assessment and personalised interventions to promote gender equality, empowerment, and long-term sustainable development for an ageing society.

Key words: Gender differences, Formal and informal care, Safety and security, Social contact, Use of time

Introduction

An exploration of gender differences should be considered as the basis for research because of the physiological and immunological differences between men and women (Ying, Pertrini and Xin 2013). Studies adopting a gender perspective can provide insights into how differences across genders affect the illness course and progression, impact of risk factors of the disease, symptom profiles, and responses to treatment between men and women, (Prata *et al.*, 2016). A research paper on quality of life (QoL) was first published in a medical journal in 1974 (Bratt and Moons, 2015) and appeared in a Psychological Abstract in 1986 (Wingate, 2016). And QoL has become an important consideration ever since. Wingate (2016) then called for more new and clinically relevant QoL findings for publication.

Literature on QoL focuses mainly on its subjective and health-related components, such as physical and mental health, self-rated life expectancy, self-rated health, emotional functioning, social contact with people, relationship with primary carers, accessibility and social inclusion, financial wellbeing, personal development, religiosity, self-determination, and rights (Reed, 2007; Schalock, 2005; Solomon *et al.*, 2010). QoL is a multidimensional concept evaluating a continuum of subjective intrapersonal dimensions and objective dimensions such as person-environment systems (Netuveli and Blane, 2008); however, a single-item global QoL scale can also be acceptable, sensitive, and valid compared to a multidimensional QoL scale (Yohannes *et al.*, 2011). Studies on “ageing in place” indicates that the immediate environment such as the design of the home and accessibility of local area can significantly influence older adults’ QoL (van Leeuwen *et al.*, 2014). This is because older people who score high on QoL are the ones enjoying independence, autonomy, social contact with people, and having a sense of security and attachment to their homes and communities (Wiles *et al.*, 2011).

However, at that time, gender differences in QoL were rarely examined (Stöbel-Richter, 2013) as researchers usually treated research participants as gender-neutral persons, assuming no differences in the preferences and needs between men and women. In a cross-national community-based survey (Raggi *et al.*, 2016) conducted in Finland, Poland, and Spain on QoL with 5639 people, aged 18-50 and 50+, it revealed that sociodemographic characteristics, social network, built environment, and chronic conditions such as disabling pain were the determinants of QoL. Another national adult social care survey conducted in the UK suggested something else, and listed accessibility of information, design of the home, and accessibility to the local area being strong predictors of QoL (van Leeuwen *et al.*, 2014). Martinez-Martin *et*

al.'s (2012) study on 1106 community-dwelling older men and women in Spain indicated that health, family, and finance were key determinants of QoL. Regrettably, none of the above community-based studies adopted a gender perspective to evaluate the similarities and differences concerning the determinants of QoL between men and women.

Even though gender differences were considered, most of the studies were conducted in clinical settings; and the gender of the participants was treated only as a moderator for examining the effects of independent variables on QoL (e.g. Chan *et al.*, 2012). Furthermore, their research findings on the impact of diseases and outcomes of the medical treatment are not consistent from a gender perspective. Another case in point, the impact of a stroke or a transient ischemic attack on the QoL of male and female patients was variedly reported in the literature (Franzén-Dahlin and Laska, 2012). Research findings on gender differences in QoL in the general population samples are also mixed (Schnurr and Lunney, 2008). Although there were studies reported gender differences, for example, Michel *et al.*'s study (2009) found that female children and adolescents' health-related quality of life declined more than their male counterparts, still those studies did not set out to validate the phenomenon of gender differences. It seems the theoretical basis for examining the gender differences in QoL has not yet been developed. Therefore, Riedinger *et al.* (2001) suggested that future research on QoL should identify why gender differences exist. A gender perspective is useful in evaluating the impact of gender relations on QoL (Fadda and Jirón, 1999) because of the physiological, immunological, psychological, and sociodemographic and economic differences between men and women. And the differences can be subtle yet distinct.

In response to the gap in knowledge regarding gender differences in QoL, the current study adopted the Theory of Social Production Function (SPF) (Lindenberg and Frey, 1993; Ormel *et al.*, 1999). SPF theory argues that the major goals for human being are physical well-being and social approval, and the fulfilment of basic need (i.e. needs satisfaction) is a necessary condition for good subjective wellbeing and effective functioning (Lindenberg, 1996; Liu, Dijst and Geertman, 2016; Ormel *et al.*, 1999). There are five interdependent instrumental goals serving as resources for achieving physical well-being and social approval, which are comfort, stimulation, affection, behavioural confirmation, and status (Wang, 2017). For example, older adults' evaluation of life satisfaction is based on comfort (e.g. physiological needs, safety), stimulation (e.g. physical and mental arousing activities), affection (e.g. exchanging emotional support, feeling of caring), behavioural confirmation (e.g. social approval), and status (e.g.

control over resources) as well as their individual resources and residential environment (Liu, Dijst and Geertman, 2016; Ormel *et al.*, 1999). The recognition of these goals can facilitate identify what types of resources, care, and support required to enhance their overall well-being. Therefore, the SPF approach is recommended as a comprehensive and universal approach to understand the gender differences in stress and health (Steverink *et al.*, 2011).

The UK is experiencing an ageing population as 18% of people were aged 65 and over in 2016 (ONS, 2017). Older people are now living longer but with multiple chronic conditions. This subsequently gives the health and social care system the additional challenge that is to manage increasingly complex medical needs and psychosocial issues, which consequently affects older adults' quality of life (Keefe *et al.*, 2009). Informal care has been a core element of community care enshrined in legislation in the UK, such as the NHS and Community Care Act 1990, and the Care Act 2014, to enhance the QoL of older adults living in community settings. Although community-based studies have been proposed as a new direction for QoL research (Kitchen and Muhajarine, 2008), limited studies examined the difference in gender and its impact on selected quality of life (QoL) items in the Theory of Social Production Function (SPF) domains among community-dwelling older adults. There are also few studies exploring the impact of both formal support services and informal care on QoL among older adults (Hellstrom *et al.*, 2004). In response to these above-mentioned gaps in research, the current study aimed to explore whether gender differences existed in selected QoL items among community-dwelling older adults in the UK and if so, to explain why. The current study hypothesizes,

1. Older female adults perceived a lower level of QoL than their male counterparts in the UK.
2. There were interaction effects between gender and residential environment, individual resources, and needs satisfaction in predicting a better quality of life among older adults in the UK.

Methods

Sampling

The Personal Social Services Adult Social Care Survey is an annual national survey measuring the effectiveness of formal social care services on service users aged 18+ years across England. All the formal social care service users in each local authority were invited to participate in the survey. For details of the sampling and data collection method, please refer to Health and Social Care Information Centre (HSCIC, 2016) and Adult Social Care Statistics Team (2016). Adult

respondents were required to return their written consent form and completed questionnaire to their Local Authority so that answers were inputted into a database for analysis. The Social Care Related Quality of Life (SCRQoL) questionnaire, which was based on the Adult Social Care Outcomes Framework (ASCOF), was used to measure how the use of formal care and support services influences QoL, including an individual's control, personal care, food and nutrition, accommodation, safety, social contact, occupation, and dignity (DH, 2017; HSCIC, 2014; Netten *et al.*, 2002). Employing stratified random sampling, a total of 73,165 service users responded to the survey in 2016 and the overall response rate was 35.7 per cent. The current study is focused on analysing the gender differences in QoL among those respondents aged 65+ in receipt of community-based services.

Data analysis

Data analysis was conducted by using SPSS 25. All missing values were removed from the analysis. Chi-square test was employed to compare the gender differences in dependent variable (i.e. QoL) and independent variables among the older women and men. The dependent variable in the current study is nominal with three categories (i.e. Very good/good, Alright, Very bad/bad) and independent variables are dichotomous (i.e. binary), multinomial logistic regression was therefore used. The "Very bad/bad" category of QoL was selected as the reference category to compare the probability of being in the "Very good/good" category of QoL. The Exp(B) (i.e. odds ratio, OR) of a coefficient indicates the probability of being in the comparison group compared to the probability of being in the reference category by an exposure to or absence of an independent variable. $OR > 1$ means that a higher occurrence in the comparison group is due to the exposure of the independent variable. Interaction effects were created to examine whether the difference of gender has a significant effect on the independent variables in predicting a very good/good QoL.

The following variables are from the ASCOF and SCRQoL questionnaire:

- 1) Dependent variable – Quality of life was measured using a one-item construct, "Thinking about the good and bad things that make up your quality of life, how would you rate the quality of your life as a whole?" The level of QoL was subjectively defined by the respondents after reviewing their current life quality and the answers were grouped into three categories: Score 1-Very good/good, Score 2-Alright, and Score 3-Very bad/bad. De Boer *et al.* (2004) argued that a single-item global QoL measure can also have good validity and excellent reliability.

2) Independent variables drawn from the ASCOF questionnaire were grouped in three SPF domains:

2.1 Residential environment

2.1.1 Home design: “How well do you think your home is designed to meet your needs?” — Score 1-My home meets my needs very well; Score 2-My home does not meet my needs well.

2.1.2 Access to local area— Score 1-I can get to all the places in my local area that I want; Score 2-I find it difficult / am unable to get to all the places in my area that I want.

2.1.3 Access to information and advice about support, services, or benefits— Score 1-Very easy to find; Score 2-Difficult/Very difficult to find.

2.2 Individual resources

2.2.1 Self-rated health— Score 1-Very good/Good; Score 2-Very bad/bad.

2.2.2 Perceived pain or discomfort— Score 1-I have no pain or discomfort; Score 2-I have moderate /extreme pain or discomfort.

2.2.3 Perceived anxiety or depression— Score 1-I am not anxious or depressed; Score 2-I am moderately / extremely anxious or depressed.

2.2.4 Activities of daily living (ADL) including getting around indoors, getting in and out of bed or chair, feeding, bathing and washing, dressing, toileting, and dealing with finances, and paperwork. The overall score was grouped into Score 1-I can do it easily by myself; Score 2-I find it difficult / can’t this by myself.

2.3 Needs satisfaction

2.3.1 Formal care—including home care, day care, meals, short term residential care, professional support, and equipment, or other community-based services provided by local authorities in England. Seven questions evaluating how the care and support services met respondents’ needs for control over daily life, clean and presentable appearance, food and drink, clean and comfortable home, safety, social contact with people, and how their time was spent. Score 1-Yes; Score 2-No.

2.3.2 Informal care—Two questions exploring whether the respondents received any practical support on a regular basis from co-residing carers and non-co-residing carers. Score 1-Yes; Score 2-No.

4. Demographic data including ethnicity (1-White; 2-Black and Minority Ethnic groups, BME) and gender (1-Male; 2-Female).

5. Covariates— Levels of satisfaction with the care and support services: Score ranging from 1-Extremely satisfied to 7-Extremely dissatisfied.

Results

A total of 28,955 respondents aged 65+ were selected for analysis in the 2016 survey. Table 1 shows that most of the older respondents were white (90.4%, n=25550) and 9.6% (n=2708) were from BME. About a third of the respondents (32.2%, n=9106) were male and 67.8% were female (n=19152). Slightly more than half of the respondents (54.9%, n=15895) rated their QoL as very good/good, 35.1% (n=10172) rated it as alright, and 10% (n=2888) rated it as very bad/bad. Fewer female respondents rated their QoL as very good/good than male respondents did ($p < .01$). More male and female respondents from BME groups perceived their QoL as very bad/bad compared to their White counterparts respectively (Male: BME=13% v White=10.4%, $\chi^2=7.025$, $df=2$, $p < .05$; Female: BME=11.5% v White=9.4%, $\chi^2=9.359$, $df=2$, $p < .01$).

Residential environment and QoL by gender

Table 2 reports that, among those respondents who could not get to all places in their local area, there were more male respondents than female respondents rated their QoL as very bad/bad ($p < .001$). Similarly, there was a trend showing that there were more males than females rated their QoL as very bad/bad among those respondents whose home design did not meet their needs and who had difficulty in accessing information.

Needs satisfaction and QoL by gender

Table 3 reveals gender differences in QoL among those who believed care and support services were not meeting their needs rated their QoL as very bad/bad QoL. There were more males than females believing formal care and support services could not help them in controlling their life ($p < .05$), in having a clean and comfortable home ($p < .001$), in maintaining social contact with people ($p < .05$), and in the way they spent their time ($p < .01$), so they rated their QoL as very bad/bad. Regarding the informal care utilisation, there were also more males than females who received no practical support from co-residing carers, rated their QoL as very bad/bad ($p < .01$).

Individual resources and QoL by gender

Results show that there were more male respondents, who perceived a very bad/bad self-rated health ($p < .01$) and suffered from pain/discomfort ($p < .001$) and anxiety/depression ($p < .001$), graded QoL as a very bad/bad compared to female respondents did (Table 4). There were also more male respondents rated their QoL as very bad/bad than female respondents did. Similarly,

there were more male respondents with a lower level of ADL also rated their QoL as very bad/bad than female respondents did ($p < .001$). Both male and female respondents from BME groups rated their health as very bad/bad compared with their White counterparts respectively (Male: BME=29.5% v White=21.4%, $\chi^2=38.710$, $df=2$, $p < .001$; Female: BME=28.0% v White=20.1%, $\chi^2=86.993$, $df=2$, $p < .001$).

Gender differences in predicting a very good/good QoL

Multinomial logistic regression in Table 5 found four interaction items in predicting a very good/good QoL relative to a very bad/bad QoL, which are (1) Female x Receiving practice care from non-co-residing carer (OR=1.501, 95%CI=1.144-1.968, $p < .01$), (2) Female x Feeling safe (OR=1.499, 95%CI=1.149-1.956, $p < .01$), (3) Female x Satisfied social contact with people (OR=1.465, 95%CI=1.086-1.978, $p < .05$), (4) Female x Being helped in the way I spent my time (OR=1.370, 95%CI=.999-1.877, $p < .05$).

Discussion

Results of hypotheses testing

Applying Chi-squared test for gender differences in quality of life, the current study found that there were a statistically significant higher proportion of older men than older women perceived their QoL as very good/good, which confirmed the first hypothesis of this study. Results of multinomial logistic regression also found gender differences in four interaction items, i.e. Non-co-residing informal care x Gender, Feeling of safety x Gender, Social contact with people x Gender, and The way how time was spent x Gender. This partially confirmed the second hypothesis of this study. The diversity of gender relations suggests that men and women are heterogeneous with different health and disease patterns, health-/help-seeking behaviours, roles and responsibilities, and levels of resilience, needs, risks, as well as access and control to resources.

Genders differences in predicting QoL

A longitudinal Swedish study (Larsson, Kåreholt and Thorslund, 2014) suggested that, because of gender differences in mortality, older women have to depend on non-co-residing informal care or formal care when living alone in old age. The current study echoes this study indicating that the probability of grading QoL as very good/good QoL was 1.501 greater relative to a very bad/bad QoL among those older women with non-co-residing informal care. Our findings

confirms previous research that informal care utilisation is an influential factor to older adults' physical health, control over daily life, and dignity (Hellstrom *et al.*, 2004). In a way, obtaining the satisfaction of needs through utilising formal and informal care is vital to improve QoL. Research found that women living with others have a lower quality of life than those living with a spouse only (Henning-Smith, 2016). This may be because, as socialist-feminists argued, women are traditionally required to provide caregiving to their co-residing others; and thus casting bio-psychological burdens and social restraint on female carers. Socialist feminism views that inequality and exploitation are socially constructed via the autonomous structures of gender race, and class (Gordon, 2013). Gender differences in informal care utilisation can be a result of differences in health conditions between the two genders. Those people receiving informal care tend to suffer more self-reported illnesses and a poorer QoL (Hellstrom *et al.*, 2004); and therefore, informal care becomes a strong support network to older women who are having more physical and psychological health issues than men do. Although women tend to view receiving help as a loss of privacy and independence (Roe *et al.*, 2001), literature suggests that older adults utilised both formal and informal care to fulfil their practical and emotional needs (e.g. Leung, Liu and Chow, 2004; Liu, Cheng, and McGhee, 2001). This clearly reflects the notion of residual welfare in the UK. In fact, if older adults have substantial risk of falls, or if their living environment is not safe, the practical care provided by informal carers can facilitate a sense of safety for them (Bolin, Lindgren and Lundborg, 2009). Practical support, such as food, provided by family members can also meet the dietary needs of elderly people (Jones *et al.*, 2009).

There are studies exploring the relationship between preference satisfaction and the fulfilment of basic human needs, such as safety and security on QoL (e.g. Costanza *et al.*, 2007; Gabriel and Bowling, 2004). Our findings revealed that the probability of grading QoL as very good/good was 1.499 greater relative to a very bad/bad QoL among those older women who felt safe. This supported the literature that feeling a sense of safety is important to a good life quality (Costanza *et al.*, 2007; Gabriel and Bowling, 2004). The sense of security in older women can be a result of, for example, safety from domestic violence and abuse, financial security after retirement, social security systems, social and political stability etc. In Maslow's hierarchy of needs, safety needs are put in a lower ranking; however, security was always rated more importantly than other needs in Maslow's hierarchy for older people (Roszkiewicz, 2004). The current study echoes to Roszkiewicz's findings that feeling safe was a strong predictor of QoL in elderly people, and particularly among older women. Therefore, health and social care

service providers should safeguard elderly people as much as possible from any potential harm, risks, and adverse life events.

The current study suggested that the probability of grading QoL as very good/good was 1.465 greater relative to a very bad/bad QoL among those older women with good social contact with people. A meta-analytic review highlighted that social relationships are a significant risk factor for mortality across age (Holt-Lunstad, Smith and Layton, 2010). A strong social tie and support network is effective in coping with challenges in ageing because social support can fulfil the psychological and emotional needs of elderly people (Patterson and Veestra, 2010). Drawing from their twin study, Agrawal *et al.*'s (2001) found a significant impact of genetic influence on relative support and confidence in females than in males. Cheng and Chan (2006) argued that women were socialised to take up the role of caretaker, and tend to define their self-concept in terms of how they relate to their significant others. In other words, the process of socialisation and biological heritage are key factors contributing to the gender differences in predicting an individual's QoL by social contact.

Our results also show that the probability of grading QoL as very good/good was 1.370 greater relative to a very bad/bad QoL among those older women being helped in the way how they spent their time. The gender differences in the use of time can be explained by the social and cultural norms. Though literature suggested four types of time use, i.e. paid work, unpaid work, self-care, and free time (Bittman and Wajcman, 2010), traditional gender-role attitudes expect women to take up a traditional gender role and motherhood, resulting in different patterns of time use between the two genders (Baxter, 2015). As a result, older women spend more time on household labour, family care, child-rearing, home-making, and care-giving than older men (Meggiolaro and Ongaro, 2015). As argued by socialist-feminists, capitalism and patriarchy have collectively and specifically oppressed unpaid women carers for producing free services to substitute or supplement formal social care (Ward-Griffin and Marshall, 2003). Though the Activity Theory and Continuity Theory highlighted the positive outcomes of active time use in ageing, such as volunteering, multi-morbidity and lack of individual or environmental resources hinder older adults' desire to participate in social leisure activities (Galenkamp *et al.*, 2016). In contrast, the Social Production Function Theory suggests an integrative approach to understand how people obtain life satisfaction by achieving their universal needs via instrumental goals within their constraints (Wang, 2017). The constraint that older women in the current study faced was suffering from more health problems compared to older men. However, they still

perceived a very good/good QoL due to the help from care and support services. Therefore, formal care may thus become a protective factor for QoL among older women who face the gender inequality in time use and adverse health conditions.

Limitations of the study

The current study has several limitations. This analysis was based on a cross-sectional survey, so it was difficult to identify causal relationships among variables, which may affect the generalisability. The dataset released for public access does not include enough data for understanding how the socioeconomic and demographic data contributed to the gender differences in quality of life in older adults. Therefore, caution should be taken in interpreting and generalising the current findings. Using a predictive statistical model to conceptualise gender differences based on the three SPF domains, i.e. residential environment, individual resources, and needs satisfaction may not effectively generate rich understanding of gender influences in the men's and women's subjective feelings and experiences of multidimensional quality of life. Nevertheless, the current study is based on a UK territory-wide annual survey, interviewing around 73,000 adult social care services users. Its quantitative analysis and findings can still provide insights to geriatric and gerontological practitioners and policymakers for developing integrated care and support services to enhance the QoL of frail and vulnerable older adults. Additionally, QoL was measured by a single-item scale, which may be unable to reflect the comprehensiveness and complex concept of QoL. Yet, literature reports that the single-item QoL measure is also valid and reliable in clinical and community-based research in compared to multi-question measure (Yohannes et al., 2011; de Boer *et al.*, 2004).

Conclusion

The current study identified gender differences in four determinants of QoL, i.e. feeling a sense of safety, social relationships, occupation of time, and use of non-co-residing informal care. There are limited studies about gender differences in the changes of QoL over time (Schmidt *et al.*, 2005). The future direction of QoL research should therefore use a validated theoretical framework such as SPF Theory to identify and explicate the gender differences in QoL among older adults. In addition to culturally sensitive perspective, health and social care practitioners working with older service users should also adopt a gender perspective to identify the unique needs of each individual and tailor-make personalised care plans for them. They should be aware of the potential gender bias in the assessment of QoL, and avoid to gender-stereotype, or assume a sameness of men and women (Obaidi and Mahlich, 2015). As the focus of assessment

and intervention should be on the service user rather than the problem (Felton, 2005), a gender-sensitive approach to co-producing integrated care by the helping professionals, service users, and informal carers can promote the QoL among older adults. That development is a good start to promote gender equality, a likely lodestar to lead the way to gender empowerment, and responsive, long-term sustainable development for our ageing society.

Table 1. Socio-demographic characteristics, QoL, and overall satisfaction with formal care

(% within gender; % within ethnicity)	Male	Female	Total
Ethnicity			
White	8198 (90.0; 32.1)	17352 (90.6; 67.9)	25500 (90.4; 100)
BME	908 (10.0; 33.5)	1800 (9.4; 66.5)	2708 (9.6; 100)
Total	9106 (100; 32.2)	19152 (100; 67.6)	28258 (100; 100) ¹
Quality of life			
Very good/good	5106 (55.1; 32.5)	10735 (54.8; 67.5)	15895 (54.9; 100)
Alright	3201 (34.2; 31.5)	6971 (35.6; 68.5)	10172 (35.1; 100)
Very bad/bad	1000 (10.7; 34.6)	1888 (9.6; 65.4)	2888 (10.0; 100)
Total	9361 (100; 32.3)	19594 (100; 67.7)	28955 (100; 100) ^{2*}
Overall satisfaction with formal care	Mean=2.39 (SD=1.1)	Mean=2.38 (SD=1.1) ³	

¹: $\chi^2=2.338$, df=1, p=.066; ²: $\chi^2=10.537$, df=2, p<.01; ³: t=.664, df=16340, p=.507. *p<.05

Table 2. Residential environment and quality of life by gender

(% within gender)	Quality of life			
	Very good/good	Alright	Very bad/bad	Total
My home design <u>does not</u> meet my needs well				
Male	2145 (43.8)	2023 (41.3)	726 (14.8)	4894 (100)
Female	4510 (44.2)	4324 (42.4)	1374 (13.5)	10208 (100) ¹
<u>Cannot</u> get to all places in my local area				
Male	3338 (48.5)	2660 (38.6)	890 (12.9)	6888 (100)
Female	7874 (50.5)	6021 (38.6)	1708 (10.9)	15603 (100) ^{2***}
<u>Difficult</u> to have access to information				
Male	2787 (51.1)	2032 (37.3)	631 (11.6)	5450 (100)
Female	5651 (50.9)	4231 (38.1)	1222 (11.0)	11104 (100) ³

¹: $\chi^2=5.583$, df=2, p=.061; ²: $\chi^2=19.975$, df=2, p<.001; ³: $\chi^2=1.764$, df=2, p=.414. ***p<.001

Table 3. Needs satisfaction and quality of life by gender

(% within gender)	Quality of life			Total
	Very good/good	Alright	Very bad/bad	
Care and support services <u>do not</u> help the respondent to have:				
Control over daily life				
Male	455 (33.8)	510 (37.9)	381 (28.3)	1346 (100)
Female	844 (34.6)	1004 (41.2)	589 (24.2)	2437 (100) ^{1*}
Clean and presentable appearance				
Male	575 (48.2)	444 (37.2)	174 (14.6)	1193 (100)
Female	1053 (48.3)	840 (38.5)	289 (13.2)	2182 (100) ²
Food and drink				
Male	1019 (48.7)	788 (37.6)	286 (13.7)	2093 (100)
Female	1800 (51.3)	1351 (36.9)	431 (11.8)	3662 (100) ³
Clean and comfortable home				
Male	1178 (45.6)	1021 (39.5)	387 (15.0)	2586 (100)
Female	2513 (48.7)	2029 (39.3)	618 (12.0)	5160 (100) ^{4***}
Feeling safe				
Male	884 (40.3)	896 (40.9)	412 (18.8)	2192 (100)
Female	1584 (39.2)	1731 (42.8)	727 (18.0)	4042 (100) ⁵
Social contact with people				
Male	1362 (45.5)	1177 (39.3)	455 (15.2)	2994 (100)
Female	2829 (46.2)	2490 (40.6)	807 (13.2)	6126 (100) ^{6*}
The way you spend your time				
Male	1333 (45.2)	1168 (39.6)	449 (15.2)	2950 (100)
Female	2841 (46.6)	2490 (40.9)	764 (12.5)	6095 (100) ^{7**}
No practical support from co-residing carer:				
Male	2772 (56.1)	1670 (33.8)	496 (29.6)	4938 (100)
Female	6829 (54.0)	4636 (36.7)	1180 (9.3)	12645 (100) ^{8**}
No practical support from non-co-residing carer:				
Male	2604 (55.5)	1544 (32.9)	546 (11.6)	4694 (100)
Female	4158 (56.3)	2441 (33.1)	786 (10.6)	7385 (100) ⁹

¹: $\chi^2=8.332$, $df=2$, $p<.05$; ²: $\chi^2=1.343$, $df=2$, $p=.511$; ³: $\chi^2=5.904$, $df=2$, $p=.052$; ⁴: $\chi^2=15.453$, $df=2$, $p<.001$;
⁵: $\chi^2=2.258$, $df=2$, $p=.323$; ⁶: $\chi^2=7.051$, $df=2$, $p<.05$; ⁷: $\chi^2=12.346$, $df=2$, $p<.01$; ⁸: $\chi^2=12.850$, $df=2$, $p<.01$;
⁹: $\chi^2=2.918$, $df=2$, $p=.232$. * $p<.05$, ** $p<.01$, *** $p<.001$

Table 4. Individual resources and quality of life by gender

(% within gender)	Quality of life			Total
	Very good/good	Alright	Very bad/bad	
Very bad/bad self-rated health				
Male	2743 (42.9)	2723 (42.5)	934 (14.6)	6400 (100)
Female	6073 (44.2)	5918 (43.0)	1759 (12.8)	13750 (100) ^{1*}
Have pain or discomfort				
Male	5024 (55.1)	3127 (34.3)	971 (10.6)	9122 (100)
Female	10446 (54.7)	6810 (35.7)	1837 (9.6)	19093 (100) ^{2****}
Have anxiety or depression				
Male	1915 (41.7)	1900 (41.3)	781 (17.0)	4596 (100)
Female	4335 (42.8)	4304 (42.5)	1485 (14.7)	10124 (100) ^{3****}
Low level of ADL ability				
Male	1712 (44.2)	1518 (39.2)	645 (16.6)	3875 (100)
Female	3720 (44.6)	3440 (41.2)	1182 (14.2)	8342 (100) ^{4****}

¹: $\chi^2=12.555$, $df=2$, $p<.01$; ²: $\chi^2=19.940$, $df=2$, $p<.001$; ³: $\chi^2=13.119$, $df=2$, $p<.001$; ⁴: $\chi^2=13.722$, $df=2$, $p<.001$

* $p<.05$, **** $p<.001$

Table 5. Multinomial Logistic regression analysis on quality of life
 —Very poor/poor QoL as reference category

Predictors	Gender	β	SE	Wald	O.R.	95% CI	
<i>Predictors with gender difference</i>							
Support from a non-co-residing carer	Male	-.254	.180	1.987	.775	.544	1.104
	Female	.406	.138	8.610	1.501**	1.144	1.968
Feeling safe	Male	.330	.183	3.246	1.391	.971	1.992
	Female	.405	.136	8.907	1.499**	1.149	1.956
Have social contact with people	Male	.227	.207	1.207	881	881	881
	Female	.382	.153	6.230	1.465*	1.086	1.978
Being helped in the way I spent my	Male	.281	.227	1.527	1.325	.848	2.068
	Female	.315	.161	3.829	1.370*	.999	1.877
<i>Predictors without gender difference</i>							
Very good/good self-rated health	Male	2.111	.320	43.451	8.259***	4.408	15.472
	Female	2.099	.226	86.085	8.159***	5.237	12.711
No anxiety / depression	Male	1.309	.177	54.449	3.701***	2.614	5.239
	Female	1.042	.128	66.014	2.836***	2.205	3.646
Can get to all places in local area	Male	.949	.266	12.712	2.584***	1.533	4.354
	Female	.795	.223	12.714	2.214***	1.430	3.427
Have control and choice	Male	.857	.197	18.870	2.357***	1.601	3.470
	Female	.857	.197	18.870	2.534***	1.869	3.436
Good ADL functioning	Male	.766	.169	20.606	2.150***	1.545	2.993
	Female	.802	.122	43.426	2.229***	1.756	2.830
BME	Male	.511	.227	5.052	1.666*	1.068	2.601
	Female	.375	.168	4.955	1.455*	1.046	2.023
<i>Predictors not statistically significant</i>							
Home design meets my needs	Male	.252	.170	2.206	1.287	.923	1.795
	Female	.105	.368	.081	1.110	.540	2.283
Home design not meet my needs	Female	-.430	.353	1.478	.651	.326	1.301
Can access to information	Male	-.154	.220	.491	.857	.556	1.320
	Female	-.095	.169	.316	.909	.653	1.266
No pain / discomfort	Male	.229	3.137	.229	1.499	.958	2.346
	Female	.184	.208	.184	1.088	.758	1.561

Have clean and presentable appearance	Male	.366	.200	3.350	1.295	.966	1.735
	Female	.258	.149	2.997	1.441	.974	2.132
Have food and drink	Male	-.162	.185	.769	.850	.592	1.221
	Female	-.142	.134	1.119	.868	.668	1.128
Have clean and comfortable home	Male	.111	.189	.343	1.117	.771	1.619
	Female	-.112	.133	.719	.894	.689	1.159
Support from a co-residing carer	Male	-.174	.196	.790	.840	.572	1.234
	Female	.235	.149	2.468	1.265	.944	1.695

Covariate

Satisfaction with care and support services		-.647	.042	236.495	.524***	.482	.569
Intercept		.481	.481	.307	2.451		

Dependent variable: Quality of life (Very good/good=1, Alright=2, Very bad/bad=3)
-2 Loglikelihood=10003.211; Chi-square=2729.635 (df=72)***; Goodness-of-fit=11330.812 (df=11412),
p=.703; Nagelkerke=.348; Cox and Snell=.295; ***p<.001, **p<.01, *p<.05

References

- Adult Social Care Statistics Team (2016). *Personal Social Services Adult Social Care Survey, England 2015-16*. NHS Digital.
- Agrawal, A., Jacobson, K., Prescott, C. & Kendler, K. (2002). A twin study of sex differences in social support. *Psychological Medicine*, 32(7), 1155-1164.
doi:10.1017/S0033291702006281
- Baxter, J. (2015). Gender role attitudes within couples, and parents' time in paid work, child care and housework. In Australian Institute of Family Studies (eds.) *The Longitudinal Study of Australian Children Annual Statistical Report 2014*. Commonwealth of Australia.
- Bittman, M., & Wajcman, J. (2000). The rush hour: The character of leisure time and gender equity. *Social Forces*, 79(1), 165-189. doi:10.1093/sf/79.1.165
- Bolin, K., Lindgren, B. & Lundborg, P. (2009) *Informal and Formal Care Among Single-Living Elderly in Europe*. Tinbergen Discussion Paper 2007-031/3. Tinbergen Institute
- Bratt, E., & Moons, P. (2015). Forty years of quality-of-life research in congenital heart disease: Temporal trends in conceptual and methodological rigor. *International Journal of Cardiology*, 195, 1-6. doi:10.1016/j.ijcard.2015.05.070
- Chan, R., Brooks, R., Steel, Z., Heung, T., Erlich, J., Chow, J., & Suranyi, M. (2012). The psychosocial correlates of quality of life in the dialysis population: A systematic review and meta-regression analysis. *Quality of Life Research*, 21(4), 563-580. 10.1007/s11136-011-9973-9
- Cheng, S., & Chan, A. C. M. (2006). Relationship with others and life satisfaction in later life: Do gender and widowhood make a difference? *Journals of Gerontology - Series B Psychological Sciences and Social Sciences*, 61(1), P46-P53. doi:10.1093/geronb/61.1.P46
- Costanza, R., Fisher, B., Ali, S., Beer, C., Bond, L., Boumans, R., Danigels, N.L., Dickinson, J., Elliott, C., Farley, J., Gayer, D.E., Glenn, L.M., Hudspeth, T., Mahoney, D., McCahill, L., McIntosh, B., Reed, B., Rizi, S.A.T., Risso, D.M., Simpatico, T., & Snapp, R. (2007). Quality of life: An approach integrating opportunities, human needs, and subjective well-being. *Ecological Economics*, 61(2), 267-276. doi:10.1016/j.ecolecon.2006.02.02
- De Boer, A.G.E.M., van Lanschot, J.J.B., Stalmeier, P.F.M., van Sandick, J.W., Hulscher, J.B.F., de Haes, J.C.J.M. & Sprangers, M.A.G. (2004). Is a single-item visual analogue scale as valid, reliable and responsive as multi-item scales in measuring quality of life? *Quality of Life Research*, 13, 311-320.
- Department of Health (DH) (2017). *The Adult Social Care Outcomes Framework: Handbook of definitions*. Crown Publication: Department of Health

- Fadda, G., & Jirón, P. (1999). Quality of life and gender: A methodology for urban research. *Environment & Urbanization*, *11*(2), 261-270. doi:10.1177/095624789901100220
- Felton, K. (2005). Meaning-based quality-of-life measurement: A way forward in conceptualizing and measuring client outcomes? *The British Journal of Social Work*, *35*(2), 221-236. doi:10.1093/bjsw/bch180
- Franzén-Dahlin, Å., & Laska, A. C. (2012). Gender differences in quality of life after stroke and TIA: A cross-sectional survey of out-patients. *Journal of Clinical Nursing*, *21*(15-16), 2386-2391. doi:10.1111/j.1365-2702.2011.04064.x
- Gabriel, Z. & Bowling, A. (2004). Quality of life from the perspectives of older people. *Ageing and Society*, *24*(5), 675-691. doi:10.1017/S0144686X03001582
- Galenkamp, H., Gagliardi, C., Principi, A., Golinowska, S., Moreira, A., Schmidt, A. E., Winkelmann, J., Sowa, A, van der Pas & Deeg, D. J. H. (2016). Predictors of social leisure activities in older Europeans with and without multimorbidity. *European Journal of Ageing*, *13*(2), 129-143. doi:10.1007/s10433-016-0375-2
- Gordon, L. (2013). Socialist feminism: The legacy of the “Second wave”. *New Labor Forum*, *22*(3), 20-28. doi:10.1177/1095796013499736
- Health and Social Care Information Centre (2016). *Personal Social Services Adult Social Care Survey, England: Methodology and Further Information*. Health and Social Care Information Centre.
- Hellstrom, Y., Persson, G. & Hallberg, I.R. (2004) Quality of life and symptoms among older people living at home. *Journal of Advanced Nursing*, *48* (6), 584–593. doi:10.1111/j.1365-2648.2004.03247.x
- Henning-Smith, C. (2016). Quality of life and psychological distress among older adults: The role of living arrangements. *Journal of Applied Gerontology*, *35*(1), 39-61. doi:10.1177/0733464814530805
- Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: A meta-analytic review. *PLoS Medicine*, *7*(7), e1000316. doi:10.1371/journal.pmed.1000316
- Jones, J., Duffy, M., Coull, Y. & Wilkinson, H. (2009) *Older people living in the Community - Nutritional Needs, Barriers and Interventions: A Literature Review*. Scotland: Scottish Government Social Research
- Keefe, B., Geron, S. M., & Enguidanos, S. (2009). Integrating social workers into primary care: Physician and nurse perceptions of roles, benefits, and challenges. *Social Work in Health Care*, *48*(6), 579-596. doi:10.1080/00981380902765592

- Kitchen, P., & Muhajarine, N. (2008). Quality of life research: New challenges and new opportunities. *Social Indicators Research*, 85(1), 1-4. doi:10.1007/s11205-007-9130-6
- Larsson, K., Kåreholt, I., & Thorslund, M. (2014). Care utilisation in the last years of life in Sweden: The effects of gender and marital status differ by type of care. *European Journal of Ageing*, 11(4), 349-359. doi:10.1007/s10433-014-0320-1
- Leung, A. C., Liu, C., Chow, N. W., & Chi, I. (2004). Cost-benefit analysis of a case management project for the community-dwelling frail elderly in Hong Kong. *Journal of Applied Gerontology*, 23(1), 70-85. 10.1177/0733464804263088
- Lindenberg, S. & Frey, B. S. (1993). Alternatives, frames, and relative prices: A broader view of rational choice theory. *Acta Sociologica*, 36, 191–205.
- Lindenberg, S. (1996). Continuities in the theory of social production functions. In H. Ganzeboom & S. Lindenberg (eds.), *Verklarende Sociologie: Opstellen voor Reinhard Wippler* (pp. 169-184). Thela Thesis: Amsterdam.
- Liu, C. P., Cheng, Y. H., & McGhee, S. M. (2001). Health care utilisation patterns of the community-dwelling elderly persons in Hong Kong. In I. Chi, N. L. Chappell, & J. Lubben (Eds.), *Elderly Chinese in Pacific Rim countries* (pp. 241-256). Hong Kong: Hong Kong University Press.
- Liu, Y., Dijst, M. J., & Geertman, S. C. M. (2016). Subjective well-being of older adults in Shanghai: The role of residential environment and individual resources. *Urban Studies*, 54(7), 41692-1714. doi: 10.1177/0042098016630512
- Martinez-Martin, P., Prieto-Flores, M., Forjaz, M. J., Fernandez-Mayoralas, G., Rojo-Perez, F., Rojo, J., & Ayala, A. (2012). Components and determinants of quality of life in community-dwelling older adults. *European Journal of Ageing*, 9(3), 255-263. doi:10.1007/s10433-012-0232-x
- Meggiolaro, S., & Ongaro, F. (2015). Life satisfaction among older people in Italy in a gender approach. *Ageing & Society*, 35(7), 1481-1504. doi:10.1017/S0144686X14000646
- Mercado, R., Páez, A., & Newbold, K. B. (2010). Transport policy and the provision of mobility options in an aging society: A case study of Ontario, Canada. *Journal of Transport Geography*, 18(5), 649-661. doi:10.1016/j.jtrangeo.2010.03.017
- Michel, G., Bisegger, C., Fuhr, D. C., Abel, T. & The KIDSCREEN group (2009). Age and gender differences in health-related quality of life of children and adolescents in Europe: A multilevel analysis. *Quality of Life Research*, 18(9), 1147-1157. doi:10.1007/s11136-009-9538-3

- Netten, A., Ryan, M., Smith, P., Skatun, D., Healey, A., Knapp, M. and Wykes, T. (2002) *The development of a measure of social care outcome for older people*. University of Kent: Personal Social Services Research Unit.
- Netuveli, G., & Blane, D. (2008). Quality of life in older ages. *British Medical Bulletin*, 85(1), 113-126. doi:10.1093/bmb/ldn00
- Obaidi, L. A., & Mahlich, J. (2015). A potential gender bias in assessing quality of life - a standard gamble experiment among university students. *ClinicoEconomics and Outcomes Research : CEOR*, 7, 227-233. 10.2147/CEOR.S84065
- Office for National Statistics (ONS) (2017). *Overview of the UK Population: July 2017*. UK Government: Office for National Statistics
- Ormel, J., Lindenberg, S., Steverink, N., & Verbrugge, L. M. (1999). Subjective well-being and social production functions. *Social Indicators Research*, 46(1), 61-90. doi:10.1023/A:1006907811502
- Patterson, A.C. & Veenstra, G. (2010) Loneliness and risk of mortality: A longitudinal investigation in Alameda County, California. *Social Science & Medicine*. 2010, 71 (1), 181-186. doi:10.1016/j.socscimed.2010.03.024
- Prata, J., Quelhas Martins, A., Ramos, S., Rocha-Gonçalves, F., & Coelho, R. (2016). Gender differences in quality of life perception and cardiovascular risk in a community sample. *Revista Portuguesa De Cardiologia*, 35(3), 153-160. 10.1016/j.repc.2015.09.022
- Raggi, A., Corso, B., Minicuci, N., Quintas, R., Sattin, D., De Torres, Chatterji, S., Frisoni, G.B., Haro, J.M., Koskinen, S., Martinuzzi, A., Miret, M., Tobiasz-Adamczyk, B. & Leonardi, M. (2016). Determinants of quality of life in ageing populations: Results from a cross-sectional study in Finland, Poland and Spain. *PloS One*, 11(7), e0159293. doi:10.1371/journal.pone.0159293
- Reed, J. (2007) *Quality of Life. In My Home Life - Quality of Life in Care Homes: A Review of the Literature*. London: Help the Aged.
- Riedinger, M. S., Dracup, K. A., Brecht, M., Padilla, G., Sarna, L., & Ganz, P. A. (2001). Quality of life in patients with heart failure: Do gender differences exist? *Heart & Lung - the Journal of Acute and Critical Care*, 30(2), 105-116. 10.1067/mhl.2001.114140
- Roe, B., Whattam, M., Young, H., & Dimond, M. (2001). Elders' perceptions of formal and informal care: Aspects of getting and receiving help for their activities of daily living. *Journal of Clinical Nursing*, 10(3), 398-405. doi:10.1046/j.1365-2702.2001.00484.x

- Roszkiewicz, M. (2004). The need to provide for security in old age in hierarchy of needs - an estimation of its ranking within the polish population. *Social Indicators Research*, 69(2), 199-218. doi:10.1023/B:SOCI.0000033590.21101.08
- Schalock, R.L., Verdugo, M.A. & Jenaro, C. (2005) Cross-cultural study of quality of life indicators. *American Journal on Mental Retardation*, 110 (4), 298–331.
- Schmidt, C. E., Bestmann, B., Küchler, T., Longo, W. E., Rohde, V., & Kremer, B. (2005). Gender differences in quality of life of patients with rectal cancer. A five-year prospective study. *World Journal of Surgery*, 29(12), 1630-1641. 10.1007/s00268-005-0067-0
- Schnurr, P. P., & Lunney, C. A. (2008). Exploration of gender differences in how quality of life relates to posttraumatic stress disorder in male and female veterans. *Journal of Rehabilitation Research and Development*, 45(3), 383-394. 10.1682/JRRD.2007.06.0099
- Solomon, R., Kirwin, P., Van Ness, P.H., O’Leary, J. & Fried, T.R. (2010). Trajectories of quality of life in older persons with advanced illness. *Journal of the American Geriatric Society*, 58 (5), 837-843. doi 10.1111/j.1532-5415.2010.02817.x
- Steverink, N., Veenstra, R., Oldehinkel, A. J., Gans, R. O. B., & Rosmalen, J. G. M. (2011). Is social stress in the first half of life detrimental to later physical and mental health in both men and women? *European Journal of Ageing*, 8(1), 21-30. 10.1007/s10433-011-0178-4
- Stöbel-Richter, Y. (2013). Gender-specific quality of life after cancer in young adulthood: A comparison with the general population. *Quality of Life Research*, 23 (4), 1377-1386. doi:10.1007/s11136-013-0559-6
- van Leeuwen, K. M., Malley, J., Bosmans, J. E., Jansen, A. P. D., Ostelo, R. W. J. G., van der Horst, H. E., & Netten, A. (2014). What can local authorities do to improve the social care-related quality of life of older adults living at home? Evidence from the adult social care survey. *Health and Place*, 29, 104-113. doi:10.1016/j.healthplace.2014.06.004
- Wang, S. (2017). Leisure travel outcomes and life satisfaction: An integrative look. *Annals of Tourism Research*, 63, 169-182. 10.1016/j.annals.2017.01.009
- Ward-Griffin, C., & Marshall, V. W. (2003). Reconceptualizing the relationship between “public” and “private” eldercare. *Journal of Aging Studies*, 17(2), 189-208. doi:10.1016/S0890-4065(03)00004-5
- Wiles, J.L., Leibing, A., Guberman, N., Reeve, J. & Allen, R.E.S. (2011). The meaning of “aging in place” to older people. *The Gerontologist*. 53 (3), 357-366. doi:10.1093/geront/gnr098
- Wingate, S. (2016). Quality of life research: More than ever. *Journal of Cardiac Failure*, 22(11), 851-852. doi:10.1016/j.cardfail.2016.09.019

- Ying, W. L., Pertrini, M. A., & Xin, L. L. (2013). Gender differences in the quality of life and coping patterns after discharge in patients recovering from burns in china. *Journal of Research in Nursing, 18*(3), 247-262. 10.1177/17449871110379301
- Yohannes, A. M., Dodd, M., Morris, J., & Webb, K. (2011). Reliability and validity of a single item measure of quality of life scale for adult patients with cystic fibrosis. *Health and Quality of Life Outcomes, 9*(1), 105-105. doi:10.1186/1477-7525-9-105