

3

Quality of life and relationships

Christine McGarrigle and Mark Ward

Contents

Key Findings

3.1	Introduction.....	27
3.2	Quality of Life.....	28
3.2.1	<i>Quality of Life and socio-demographics</i>	28
3.2.2	<i>Quality of life and marital status</i>	31
3.2.3	<i>Quality of life and chronic conditions</i>	32
3.2.4	<i>Quality of life and functional limitations</i>	32
3.2.5	<i>Quality of life and social integration</i>	35
3.2.6	<i>Quality of life by quality of relationships</i>	36
3.3	Longitudinal change in quality of life with changing functional limitations	37
3.3.1	<i>Longitudinal change in quality of life and functional limitations</i>	37
3.3.2	<i>Longitudinal change in quality of life by change in functional limitations between Wave 1 and Wave 4</i>	40
3.3.3	<i>Change in quality of life with change in functional limitations between Waves 1 and 4 by social integration and gender</i>	41
3.3.4	<i>Change in quality of life with increasing disability moderated by positive supportive relationships with friends</i>	42
3.4	Discussion	43
3.5	Conclusion.....	44
3.6	References	44

3

Quality of life and relationships

Key Findings

- The average quality of life score measured through CASP-12, among TILDA participants is 27.3 in Wave 4. This score suggests that, on average, older people in Ireland experience a good quality of life.
- Quality of life doesn't decline linearly with age, but instead increases to a peak at age 68 and then starts to gradually decline, reaching the value observed among 50 year olds at age 80, decreasing steadily from that age onwards.
- The factors which predominantly influence quality of life are social factors, including social networks and social activities, while health-related factors like functional limitations are also important.
- Quality of life decreases with increasing number of chronic health conditions.
- Quality of life decreases as the number of activities of daily living (ADL) and instrumental ADL (IADL) limitations increase.
- Increased social integration, through maintenance of a larger social network and positive supportive relationships with friends is associated with higher quality of life.
- One third of women (31%) report positive supportive friendships in Wave 4, compared to 16% of men, similar to that reported in Wave 1. Relationship quality within social networks is important, and those who report positive supportive relationships with friends report higher quality of life relative to those with less supportive relationships.
- Over 21% of TILDA respondents reported the highest level of social integration in Wave 4, with 39% moderately integrated, 29% moderately isolated and 11% most isolated, similar to that reported in Wave 1. Men and women reporting highest levels of social integration had higher mean quality of life scores than those reporting lower levels of social integration.

3.1 Introduction

Quality of life is recognised as an important measure of wellbeing as people get older. It encompasses not just physical measures of health but the overall wellbeing of an individual. It is a multi-dimensional construct and includes, for example, when individuals stay active and social interactions are maintained with productive activities, thus improving quality of life by improving self-esteem. In previous research, we determined that quality of life peaked at age 68, and declined rapidly past 80 years (1). We found that social networks and integration into family and society were important for higher quality of life (1) and that an increase in ADL and IADL limitations over a two-year period was associated with a decline in quality of life (2).

Disability increases with advancing age and among community-dwelling people in Ireland, 11% of men and 14% of women aged 50 or over have at least one limitation in daily activities (3). Disability in older people has been associated with depression, lower quality of life, social isolation and loneliness (4,5). The influence of poor health on loneliness may be amplified in rural areas (6). This can be due to a number of influences, including physical conditions like pain, or an inability to continue accessing one's social circle and participate in social activities in their wider community (6).

Social integration has been established to have positive health effects (7-9). However, the quality of relationships that people maintain has also been shown to be important and has direct effects on both health and wellbeing (10-13). Ireland is unique in the quantity of social relationships available to individuals due to family size, although this is counter-balanced by large-scale migration of both past and current generations of younger people, thus breaking the continuity of family relations.

In this Chapter, information from those who participated in the first four waves of TILDA are included. Participants are divided into three age groups, based on their age at Wave 1: 50 to 64 years (n=3,284), 65 to 74 years (n=1,409), and 75 years and older (n=605). Education consists of three levels: primary education or less (n=1,309), secondary level education (n=2,196) and third level education (n=1,800). The majority of the information provided in this Chapter was collected during the computer assisted personal interview (CAPI), while the quality of life, and supportive relationship information was collected through the self-completion questionnaire (SCQ).

The aim of the Chapter is to describe changing functional limitations in community-dwelling older adults in Ireland between the first four waves of data collection and to examine how these changes impact on quality of life. To do this we carry out a cross-wave analysis where we compare the cross-sectional distributions of quality of life in Wave 1 and Wave 4,

and examine whether these vary with age, gender, educational attainment, marital status, functional limitations and close relationships. Additionally, we carry out a longitudinal analysis of change in functional limitations within individuals, and compare this to the corresponding change in quality of life. We also identify if social integration and supportive relationships with friends lessen the negative impact of functional limitations on quality of life.

3.2 Quality of Life

3.2.1 Quality of life and socio-demographics

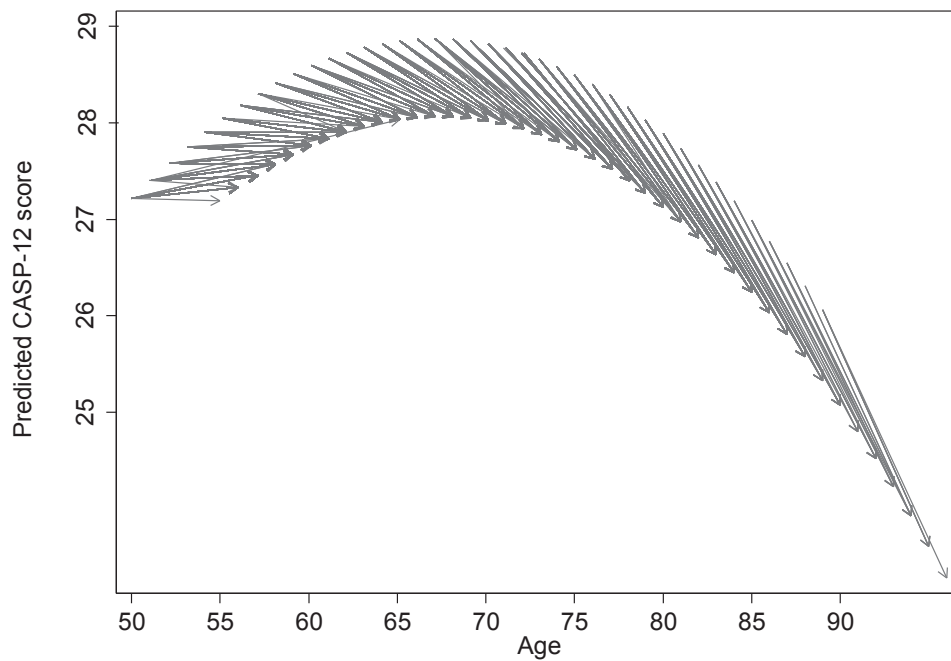
TILDA uses the 12-item self-report measurement, (CASP-12), to assess quality of life in Wave 4 (14). The scale covers the four domains considered to encompass quality of life (Table 3.1). The items included in CASP-12 consist of statements such as: 'I can do the things I want to do', 'I look forward to every day' and 'I feel that life is full of opportunities'. These statements are presented to participants in the SCQ and they are asked to indicate how often (often, sometimes, not often or never), they feel each statement applies to their life. Each item is summed to give an overall score (range 0 to 36) with higher scores denoting better quality of life.

Table 3.1: Quality of life domains.

Quality of life domain	
Control	The ability to actively participate in one's environment.
Autonomy	The right of the individual to be free from the unwanted interference of others.
Self-realisation	The fulfilment of one's potential.
Pleasure	The sense of happiness or enjoyment derived from engaging with life.

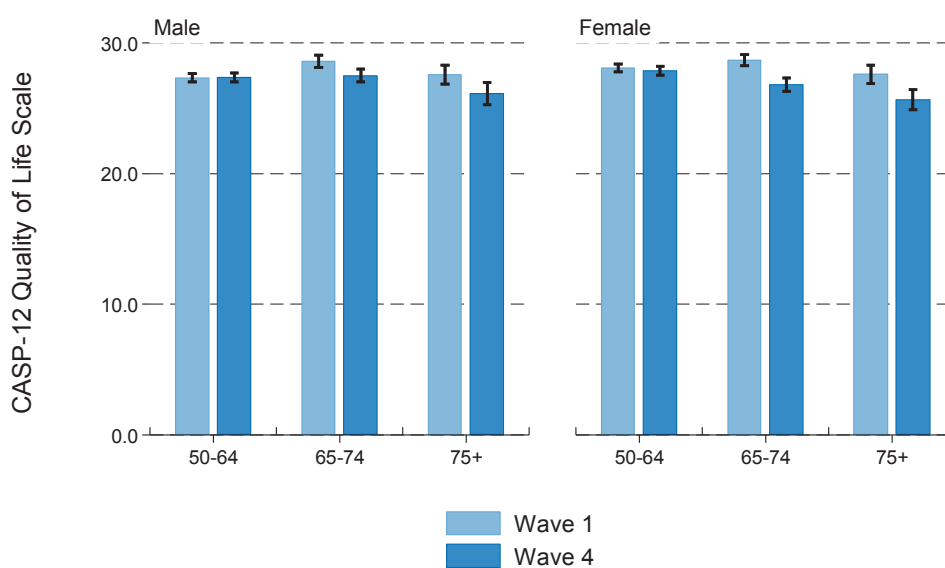
The average quality of life score measured with CASP-12, among TILDA participants is 27.3 (range 4 to 36) in Wave 4. This score suggests that, on average, older people in Ireland experience a good quality of life. Figure 3.1 shows how the average quality of life scores change over time for adults aged 50 years and over.

Figure 3.1: Changing trajectories of quality of life between Waves 1 and 4.



Each arrow in the figure shows the average change in quality of life, based on age at Wave 1, over 6 years of follow-up. Quality of life doesn't decrease linearly with age as might be expected, but instead increases to a peak at age 68 and then starts to gradually decline, reaching the value observed among 50 year olds at age 80 and decreasing steadily from that age onwards. The patterns of change were similar for men and women, as shown in Figure 3.2 where quality of life is highest in the 65-74 year age group and decreases over time in most age groups for both men and women.

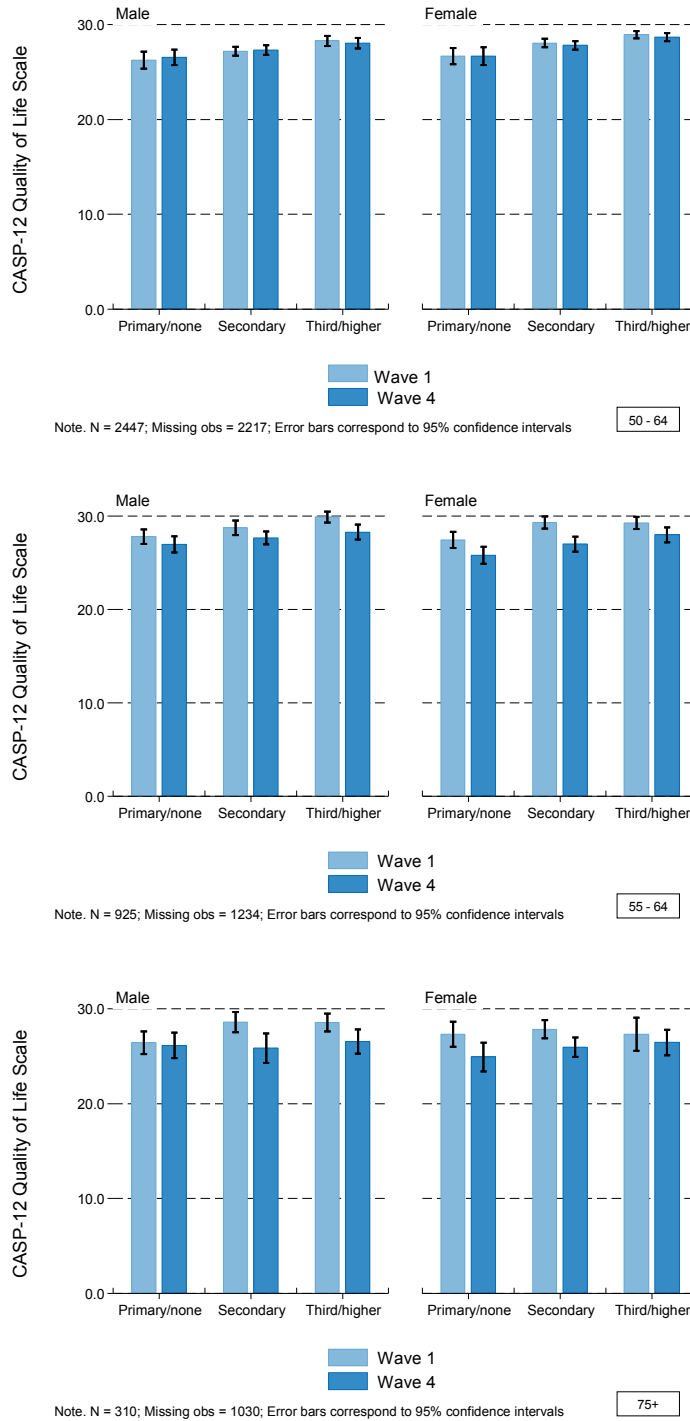
Figure 3.2: Quality of life between Wave 1 and Wave 4 by age group and gender.



Note. N = 3683; Missing obs = 5033; Error bars correspond to 95% confidence intervals

Figure 3.3 shows the association between mean quality of life scores and educational attainment within three age groups and gender. Higher educational attainment was related to higher quality of life scores across all waves of TILDA, although these differences were less pronounced in those aged 75 years and over, where many other ageing-related factors also contribute to lower quality of life. Similar trends are seen for both men and women across age groups, with quality of life decreasing in later waves in older age groups.

Figure 3.3: Quality of life between Wave 1 and Wave 4 by gender, educational attainment and age group.



3.2.2 Quality of life and marital status

Many studies, including TILDA, have shown that married people have higher quality of life and life satisfaction than those who have never married or are separated or divorced (1, 5, 15, 16), while depressive symptoms are higher in older people who have never married (17). In Wave 4, quality of life was higher in those who were married, and lowest in those individuals who were separated or divorced, for both men and women. In men who were widowed, quality of life was similar to those who were married, however in widowed women, quality of life was lower and similar to women who were separated or divorced. These differences remained between Wave 1 and Wave 4, although mean quality of life scores were lower in Wave 4 for each group.

Table 3.2: Quality of life by marital status and gender.

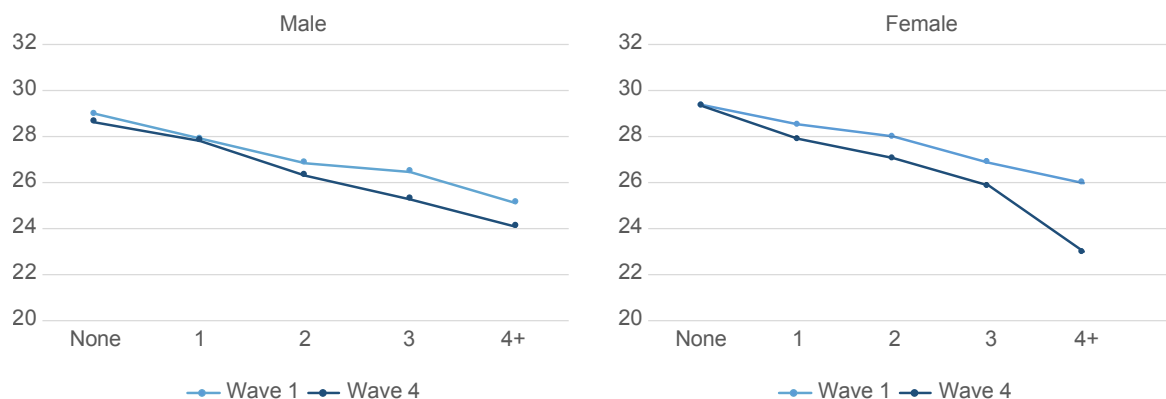
	W1 Mean (95% CI)	W2 Mean (95% CI)	W3 Mean (95% CI)	W4 Mean (95% CI)
Male				
Married	28.09 (27.83,28.35)	27.54 (27.27,27.81)	27.32 (27.04,27.59)	27.65 (27.38,27.92)
Never married	25.78 (24.84,26.71)	24.84 (23.88,25.81)	25.10 (24.22,25.98)	26.02 (25.12,26.93)
Sep/divorced	25.85 (24.52,27.19)	24.29 (22.84,25.74)	24.12 (22.79,25.45)	25.37 (24.04,26.71)
Widowed	28.66 (27.67,29.66)	27.65 (26.89,28.41)	27.57 (26.66,28.47)	27.79 (26.91,28.67)
Female				
Married	28.45 (28.16,28.74)	27.49 (27.19,27.80)	27.26 (26.93,27.60)	27.93 (27.62,28.23)
Never married	28.25 (27.37,29.13)	27.11 (26.21,28.00)	26.17 (25.24,27.09)	27.36 (26.47,28.26)
Sep/divorced	26.55 (25.70,27.40)	25.93 (25.06,26.80)	24.97 (23.98,25.96)	26.02 (25.01,27.03)
Widowed	27.80 (27.17,28.43)	26.69 (26.08,27.29)	25.94 (25.36,26.51)	26.26 (25.71,26.81)
Total				
Married	28.26 (28.05,28.47)	27.52 (27.30,27.74)	27.29 (27.06,27.53)	27.78 (27.56,28.00)
Never married	26.88 (26.20,27.56)	25.86 (25.17,26.55)	25.59 (24.96,26.22)	26.63 (25.98,27.28)
Sep/divorced	26.24 (25.48,27.00)	25.26 (24.47,26.05)	24.59 (23.78,25.41)	25.74 (24.93,26.54)
Widowed	27.99 (27.45,28.52)	26.94 (26.45,27.42)	26.34 (25.86,26.82)	26.62 (26.15,27.09)

3.2.3 Quality of life and chronic conditions

As chronic conditions affect health, they can also influence quality of life. In TILDA, we ask participants if a doctor has ever diagnosed one or more of a number of conditions. A count of chronic diseases was generated for participants at each wave based on their self-reported doctor's diagnosis of the following conditions: hypertension, diabetes, angina, heart attack, heart failure, transient ischaemic attack, stroke, arthritis, lung disease and osteoporosis. This was categorised as a count of 0, 1, 2, 3 and 4+ chronic conditions.

Figure 3.4 shows quality of life by number of chronic conditions for men and women. There is a clear gradient seen between an increasing number of chronic conditions, and decreasing quality of life scores and this trend was similar for both men and women and in Waves 1 and 4. Women in Wave 4 reporting four or more chronic conditions had lower mean quality of life scores than women with a similar number of chronic conditions in Wave 1.

Figure 3.4: Changing quality of life by number of chronic conditions Wave 1 and Wave 4, by gender.

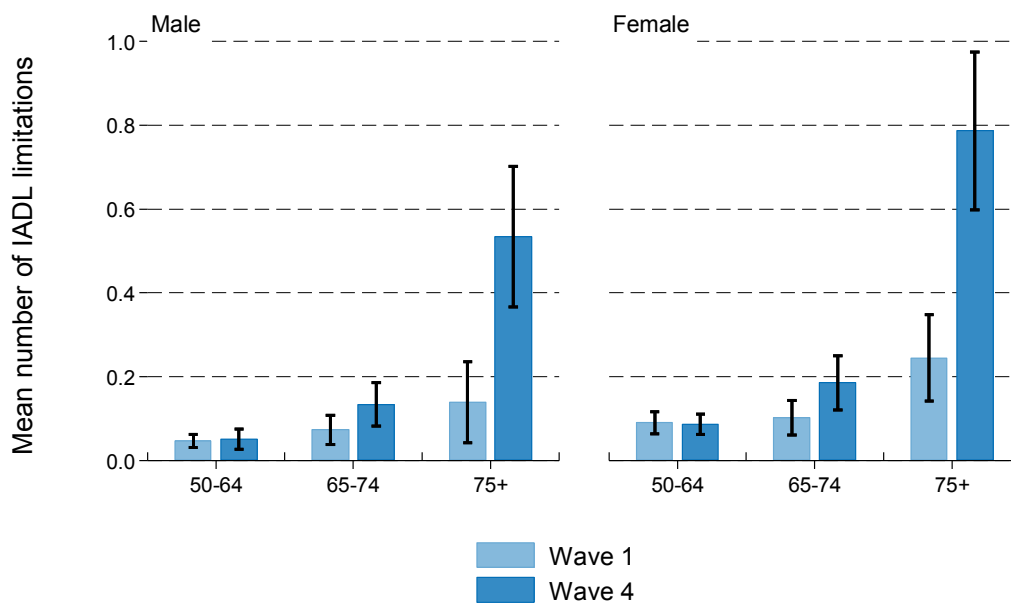


3.2.4 Quality of life and functional limitations

It is well established that disability is a determinant of wellbeing and quality of life. Disability status is measured in TILDA as self-reported limitations in the activities of daily living (ADLs; help with walking across a room, dressing, bathing, eating, getting in and out of bed, and using the toilet) and instrumental activities of daily living (IADLs; preparing meals, shopping for groceries, making telephone calls, taking medications and managing money). Health professionals often use these activities as a measure of disability or functional status. The number of ADL limitations and IADL limitations was calculated and categorised as 0, 1, 2 and 3+ limitations.

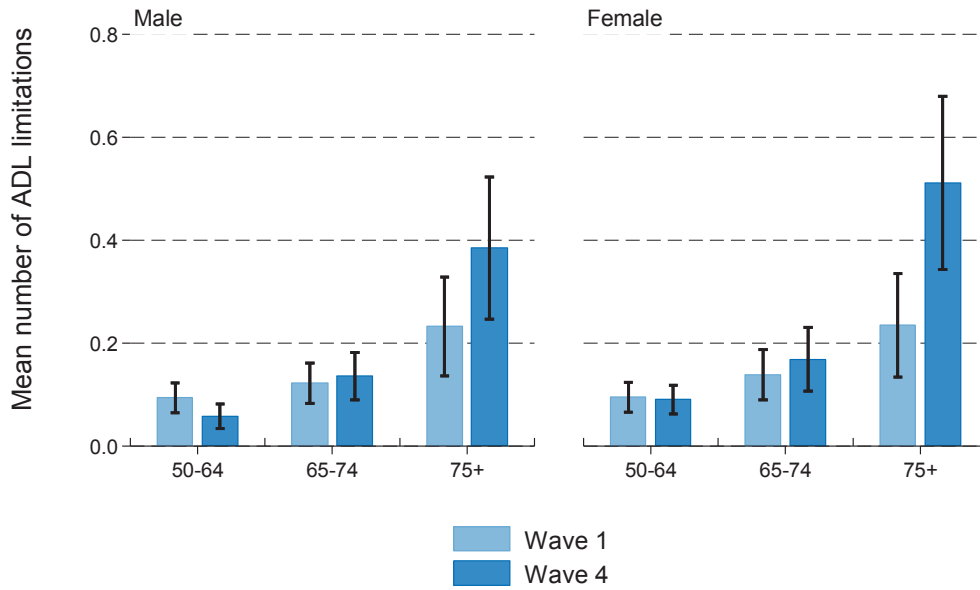
The number of IADL and ADL limitations reported at Wave 1 and Wave 4, by age group and gender are shown in Figures 3.5 and 3.6. In Wave 4, 8% of men and 11% of women reported at least one ADL compared to 8% of men and 7% of women in Wave 1. While 6% of men and 7% of women reported at least one IADL impairment in Wave 4, compared to 4% and 7% in Wave 1 respectively. The highest number of limitations are seen in men and women aged 75 and over, and these increased between Wave 1 and Wave 4.

Figure 3.5: Mean number of IADL limitations in Wave 1 and Wave 4, by age group and gender.



Note. N = 5566; Missing obs = 3150; Error bars correspond to 95% confidence intervals

Figure 3.6: Mean number of ADL limitations in Wave 1 and Wave 4 by age group and gender.



Note. N = 5566; Missing obs = 3150; Error bars correspond to 95% confidence intervals

Figures 3.7 and 3.8 show the associations between mean quality of life scores and increasing IADL and ADL limitations for men and women. For both ADLs and IADLs, quality of life decreases with increasing numbers of ADL and IADL limitations overall. This decline in quality of life scores with increasing numbers of limitations is consistent between Wave 1 and Wave 4 in men and women, although the gradient of decline in quality of life is steeper for women than men.

Figure 3.7: Quality of life by IADL limitations Wave 1 and Wave 4 by gender.

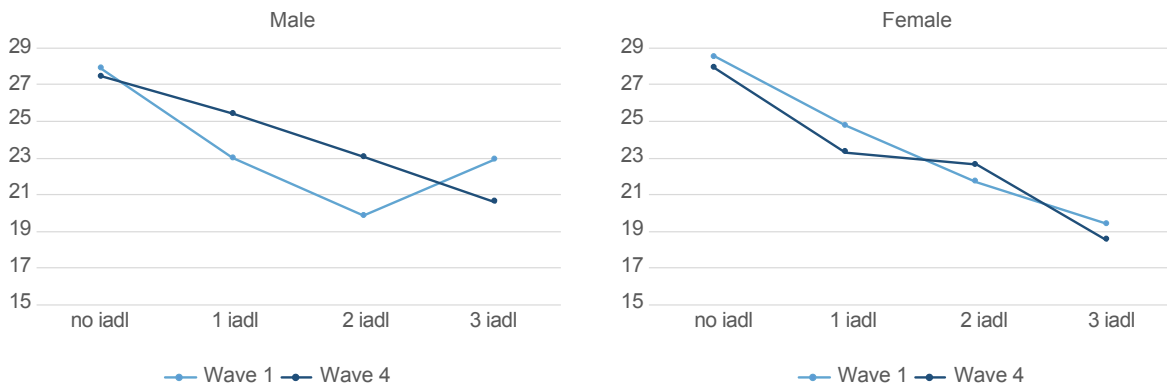
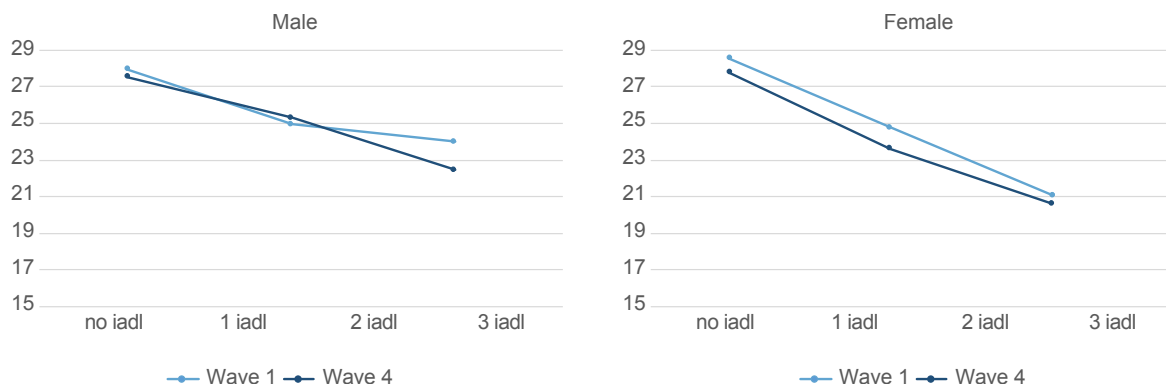


Figure 3.8: Quality of life by increasing ADL limitations Wave 1 and Wave 4 by gender.

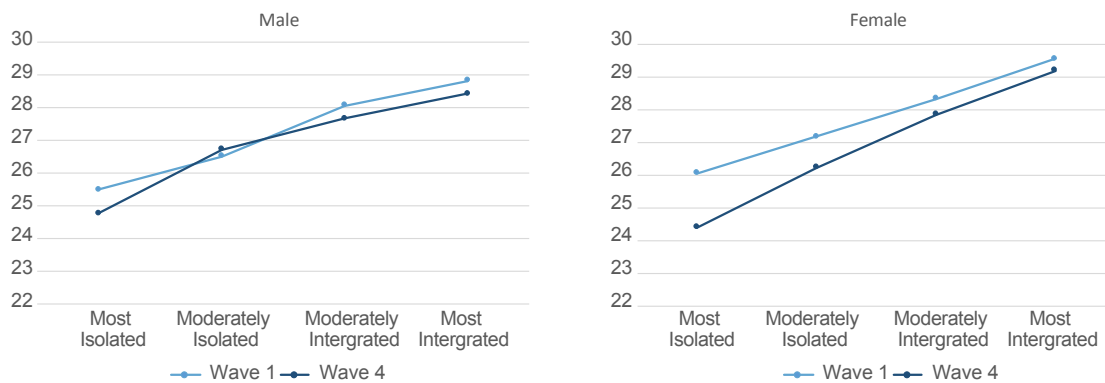


3.2.5 Quality of life and social integration

There is consensus that supportive social ties are beneficial for mental health and wellbeing (18, 19). This is thought to work both through promotion of positive emotions and buffering the harmful effects of stress (18). Social support structures and social interaction are recognised as being important for older people with disability and declining functional ability and health (20). Furthermore, previous research has shown that there are socio-economic inequalities in disability, and report a clear wealth gradient in disability among older English adults (21, 22), especially for those with elevated depressive symptoms (21).

Social integration is measured in TILDA using the Berkman-Syme Social Network Index. This is a composite scale scored 0-4 quantifying four types of social connection: married; number of close ties with friends, family and children; member of a church; member of voluntary organisations including clubs. A score of 0-1 indicates a participant who is most isolated, while a score of 4 indicates that they are most integrated.

Figure 3.9: Quality of life by social integration score Wave 1 and Wave 4 by gender.



Over 21% of TILDA respondents reported the highest level of social integration in Wave 4, with 39% moderately integrated, 29% moderately isolated and 11% most isolated. This was similar to figures of 24%, 41%, 27% and 8% reported in Wave 1 respectively. Men and women reporting highest levels of social integration had higher mean quality of life scores than those reporting lower levels of social integration (Figure 3.9). Comparisons between Wave 1 and Wave 4 show that overall, this association did not change over time (Figure 3.9). The strength of the relationship between quality of life and social integration scores remained the same, however, in Wave 4, the most isolated women had lower quality of life relative to women reporting similar levels of isolation in Wave 1.

3.2.6 Quality of life by quality of relationships

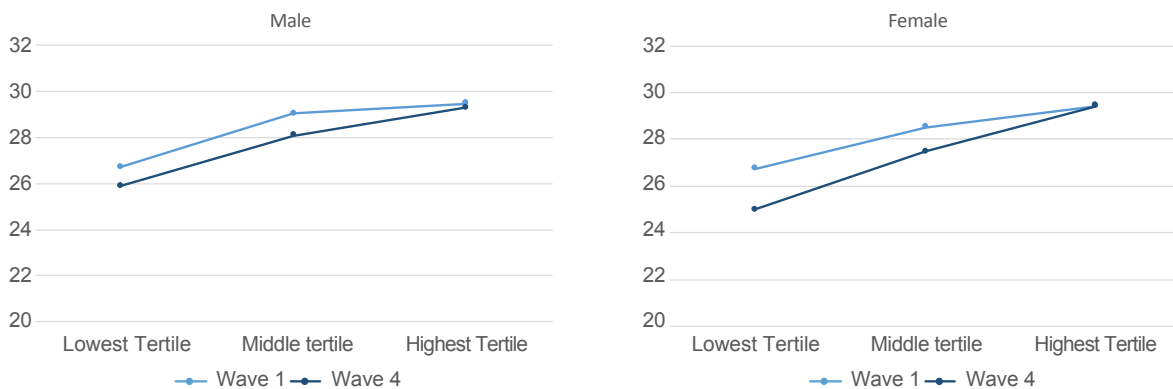
While being integrated into social networks has positive implications for health and wellbeing, it is not only the quantity of social relationships that is important, but also the quality of those relationships. In TILDA, we determine the quality of social support received from friends using questions asked in the SCQ. Positive relationships with friends are assessed through a series of questions, 'Do you feel you can rely on them if you have a serious problem', 'how much do they understand the way you feel about things', and 'how much can you open up to them if you need to talk about your worries'. Answer options varied from 'not at all', to 'a lot' (0-9). These scores are grouped into tertiles, with the highest tertile indicating positive supportive relationships, and the lowest tertile, indicating the least supportive relationships with friends.

One third of women (31%) report positive supportive friendships in Wave 4, compared to 16% of men, similar to that reported in Wave 1. While 27% of women report low supportive friendships, this proportion has decreased (from 38% in Wave 1). A similar decreasing

trend in the proportion who report low supportive friendships is seen for men, from 60% in Wave 1 to 46% in Wave 4, although a higher proportion of men consistently report low supportive friendships than women.

Cross-sectional analysis of Wave 4 data show that people who have positive supportive relationships with their friends have higher quality of life scores than those with less supportive friendships. Comparisons between Wave 1 and Wave 4 show that this association between supportive friendships and quality of life did not change over time for men or women (Figure 3.10).

Figure 3.10: Quality of life by positive relationship with friends at Wave 1 and Wave 4 by gender.



3.3 Longitudinal change in quality of life with changing functional limitations

3.3.1 Longitudinal change in quality of life and changing functional limitations

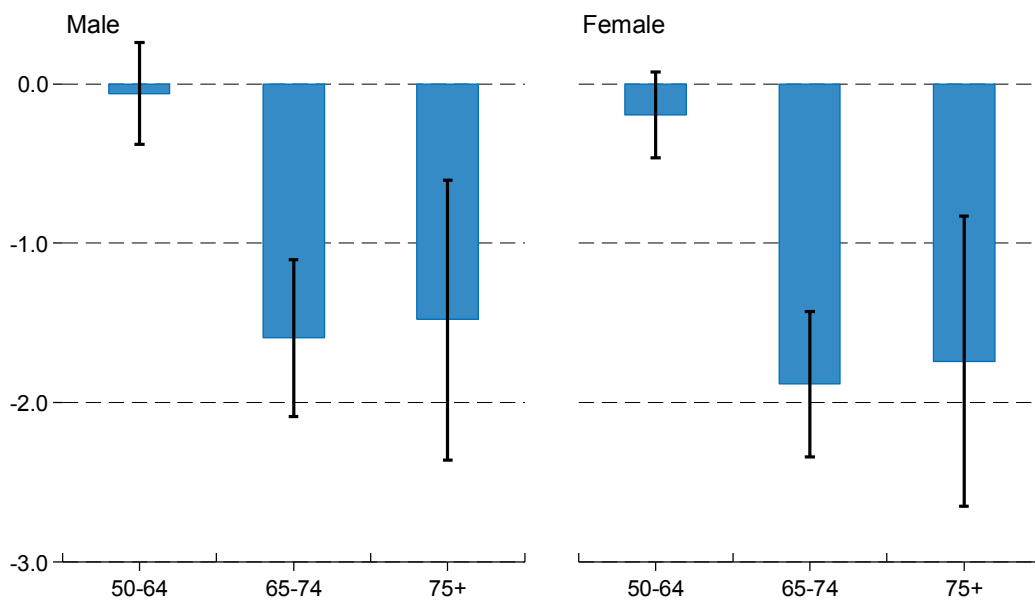
Functional limitations are used in this section as an important determinant of wellbeing that influences both independence and quality of life in older people. We examine longitudinally, change in functional limitations and quality of life scores. We also examine how higher social integration and positive supportive relationships influence these changes in quality of life.

To assess whether quality of life changed within individuals as they developed increased functional limitations, we derive the change in CASP-12 score between Wave 1 and Wave 4 for each participant, and examine this change in relation to change in limitations.

CASP-12 change score is calculated as (CASP-12 Wave 4 – CASP-12 Wave 1), and is a continuous value (with negative and positive values reflecting a decrease or increase in quality of life respectively). Change in functional limitations is derived from the number of ADL and IADL limitations a participant reports in Wave 4 compared to Wave 1. This was categorised as follows: -1 or more, no change, 1, 2 or more additional ADL/IADL limitations with negative and positive values reflecting a decrease or increase in number of limitations respectively.

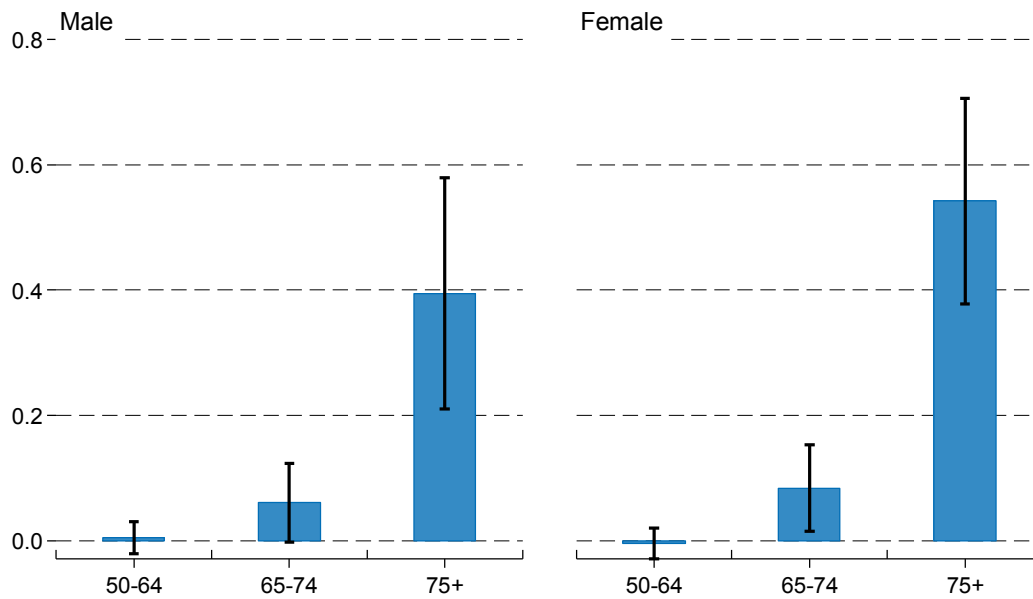
Figure 3.11 presents the change in quality of life score between Wave 1 and Wave 4 by age group and gender. Quality of life decreased in men and women aged 65 years and over between Wave 1 and Wave 4, but remained stable in those aged 50 to 64 years at Wave 1. Figures 3.12 and 3.13 present the change in IADL and ADL limitations between Waves 1 and 4. An increase in IADL limitations are seen for men aged 75 years and older, and women aged 65 years and older. An increase in ADL limitations are seen in men and women aged 75 years and older.

Figure 3.11: Change in quality of life between Wave 1 and Wave 4 by age group and gender.



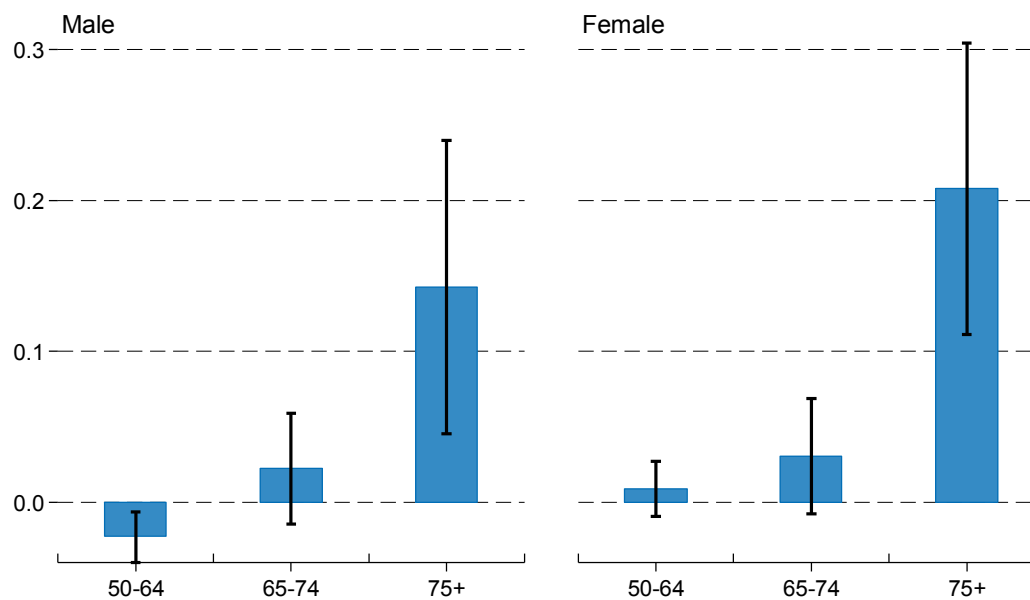
Note. N = 3586; Missing obs = 1720; Error bars correspond to 95% confidence intervals

Figure 3.12: Change in IADL limitations between Wave 1 and Wave 4, by age group and gender.



Note. N = 5298; Missing obs = 8; Error bars correspond to 95% confidence intervals

Figure 3.13: Change in ADL limitations between Wave 1 and Wave 4, by age group and gender.



Note. N = 5298; Missing obs = 8; Error bars correspond to 95% confidence intervals

3.3.2 Longitudinal change in quality of life by change in functional limitations between Wave 1 and Wave 4

We examine whether quality of life changes in older people as disability increases. Figures 3.14 and 3.15 show that there is a small decline in quality of life for both men and women with no change in functional limitations between Waves 1 and 4. Quality of life decreases in women with an increasing number of ADL and IADL limitations at Wave 4, and although there is a similar trend in men, the change in quality of life is not significant.

Figure 3.14: Change in quality of life by changing IADL limitations between Wave 1 and Wave 4 by gender.

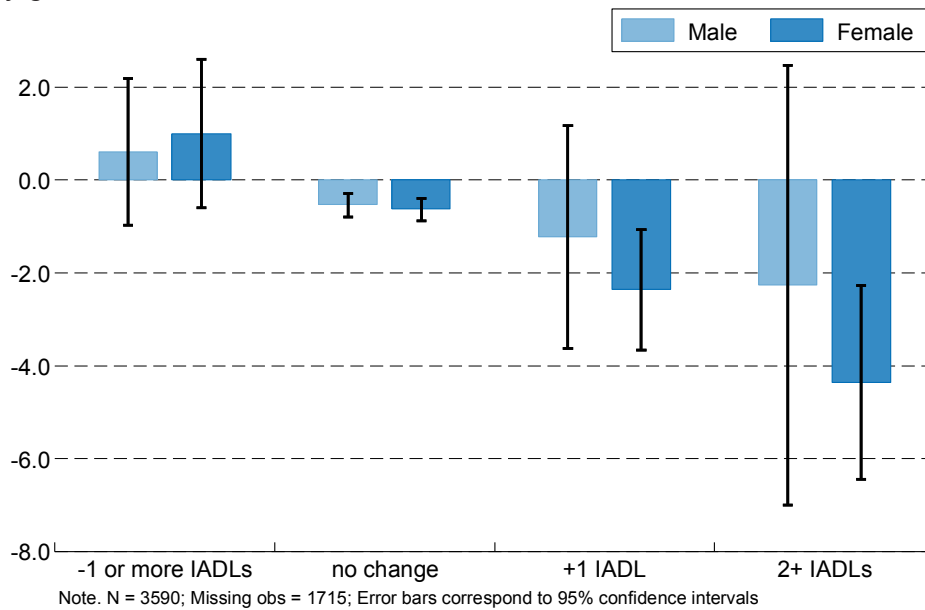
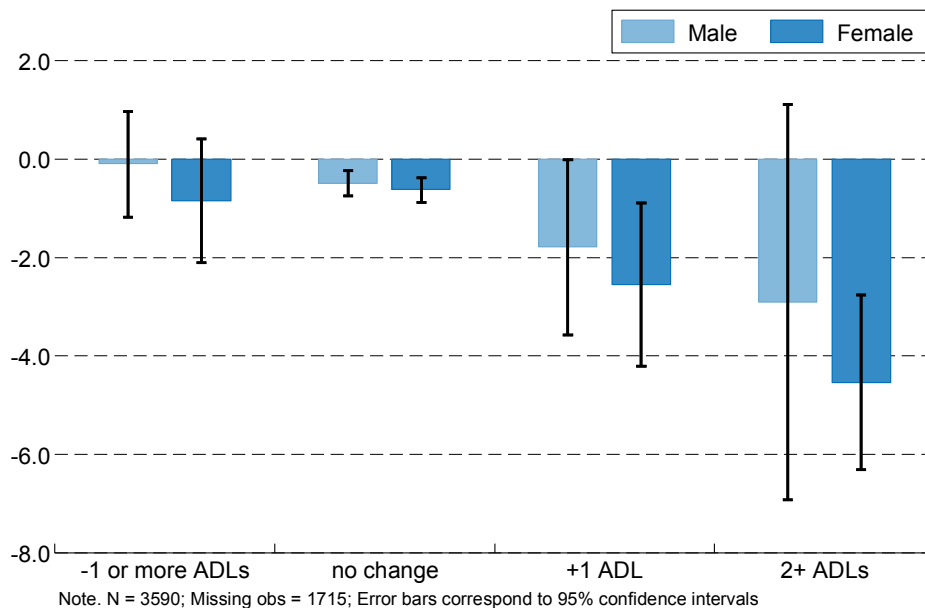


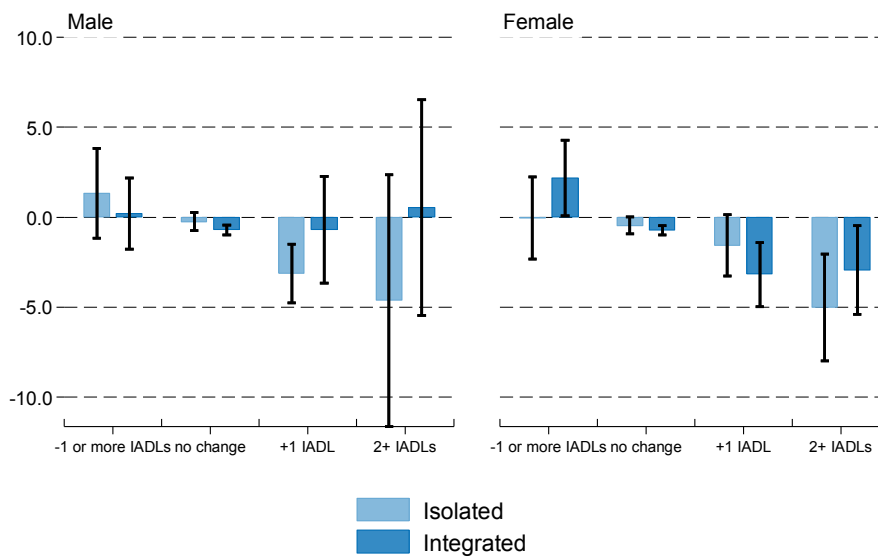
Figure 3.15: Change in Quality of Life by changing ADL limitations between Wave 1 and Wave 4 by gender.



3.3.3 Change in quality of life with change in functional limitations between Waves 1 and 4 by social integration and gender

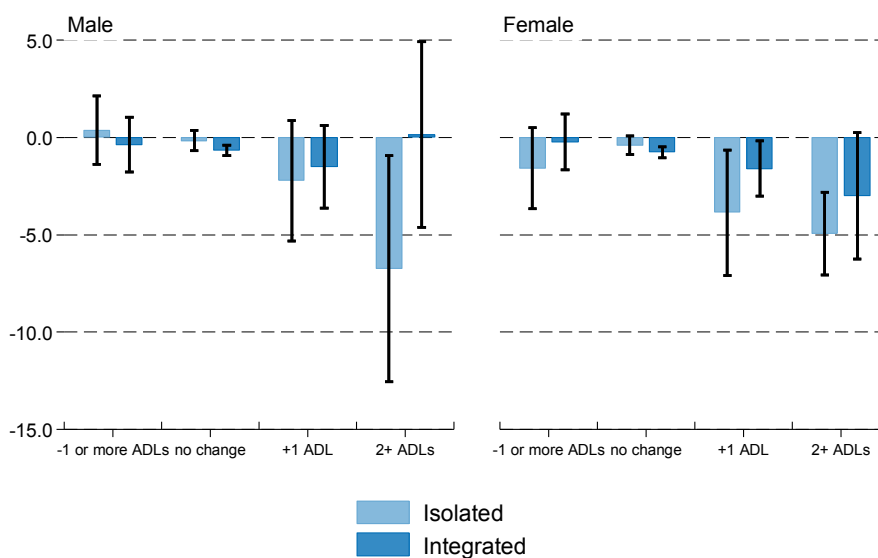
As the quality of relationships are important, we compare quality of life changes with increasing IADL and ADL limitations in people who are socially integrated with older people who are socially isolated. We grouped the social integration score into two groups (most isolated/moderately isolated, and compared to moderately integrated/most integrated).

Figure 3.16: Change in quality of life by changing number of IADL limitations Wave 1 to Wave 4, by level of social integration and gender.



Note. N = 3580; Missing obs = 1725; Error bars correspond to 95% confidence intervals

Figure 3.17: Change in Quality of life by changing number of ADL limitations Wave 1 to Wave 4, by level of social integration and gender.



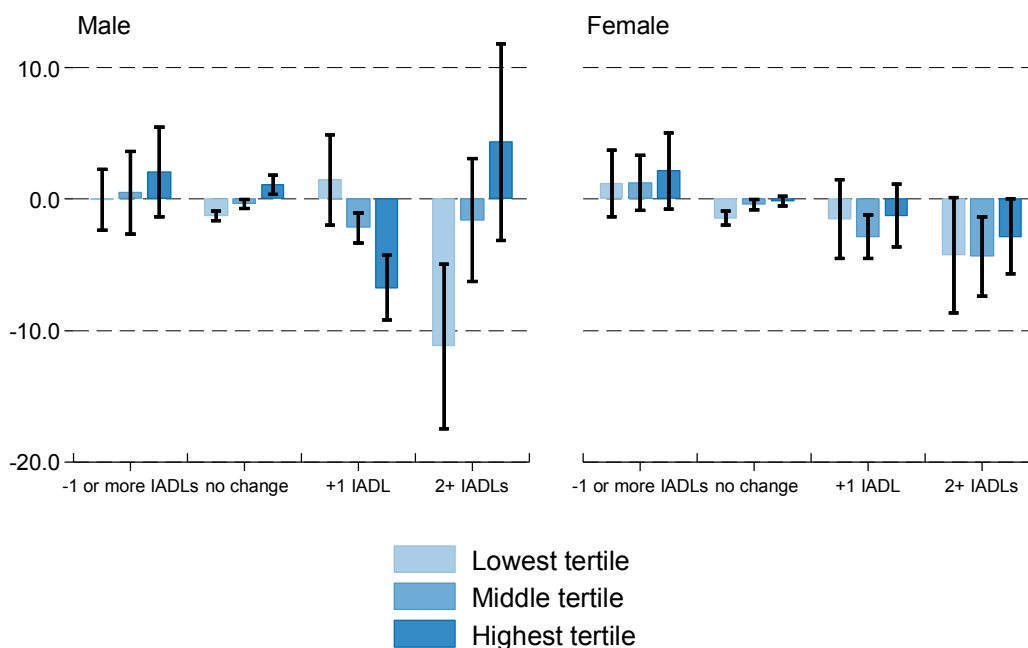
Note. N = 3580; Missing obs = 1725; Error bars correspond to 95% confidence intervals

Level of social integration is related to the change in quality of life in older people as ADL and IADL limitations increase. Figure 3.16 and 3.17 show that quality of life did not decline as number of IADL and ADL limitations increased in men who are more socially integrated. A similar trend, with less decline in more socially integrated women is also seen. However, those who are most isolated and particularly women, had notable declines in quality of life with increasing ADL and IADL limitations.

3.3.4 Change in quality of life with increasing disability moderated by positive supportive relationships with friends

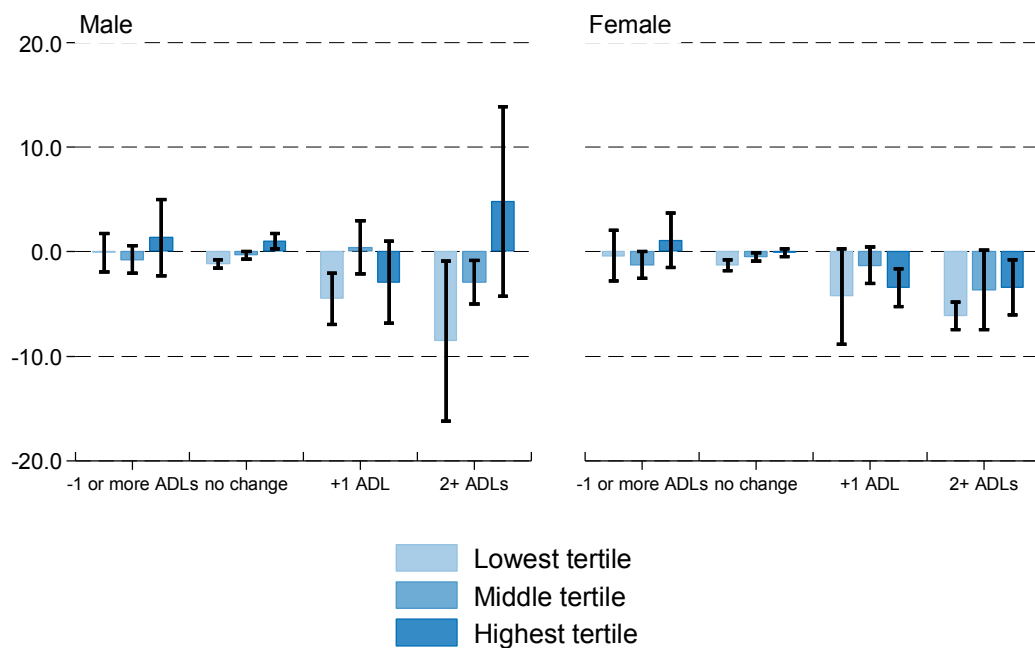
Similarly, supportive relationships with friends moderate the effect of increasing functional limitations on quality of life, particularly in women who report that they feel their friends were able to offer them the support they need. Figure 3.18 shows that quality of life did not decline with increasing number of IADL limitations for women who report the highest supportive relationships with their friends, and there is some evidence of a gradient in decline by decreasing level of positive support. Figure 3.19 shows a similar relationship for ADL limitations.

Figure 3.18: Changing quality of life scores with changing IADL limitations between Wave 1 and Wave 4, the moderating effects of positive supportive relationships with friends.



Note. N = 3479; Missing obs = 1827; Error bars correspond to 95% confidence intervals

Figure 3.19: Changing quality of life scores with changing ADL limitations between Wave 1 and Wave 4, the moderating effects of positive relationships with friends.



Note. N = 3479; Missing obs = 1827; Error bars correspond to 95% confidence intervals

3.4 Discussion

Overall, quality of life of middle-aged and older people in Ireland decreased between Wave 1 and Wave 4. However, this decrease is not just a function of ageing, but is associated with gender, marital status, educational attainment, health, disability and social support characteristics.

Quality of life declines with increasing levels of disability, and chronic conditions. An increase in social integration is associated with a corresponding increase in quality of life while social isolation is associated with lower quality of life. We also find that relationship quality within social networks is important, and those who report a positive supportive relationship with friends report a higher quality of life relative to those with less supportive relationships. These findings indicate the importance of having an adequate and active social network to maintain wellbeing, but also emphasise that the quality of relationships, not just the quantity is important.

We find that increases in ADL and IADL limitations over time within individuals, are associated with a corresponding decrease in quality of life in both men and women. These declines in quality of life with increasing functional limitations are not uniform however, and differences are seen between those who are more socially integrated, compared to those who are more isolated. Increased social integration, through maintaining a larger

social network and positive supportive relationships with friends is associated with higher quality of life and moderate the association between increasing functional limitations and lower quality of life. Quality of life remains stable over time for men who have higher social integration and report positive supportive relationships with friends, even as functional limitations increase over the six-year period of the study. This moderating effect of social integration and social relationships is also seen in women, although to a lesser extent.

While social networks may decrease in older people, these findings highlight the importance of the quality of the social relationships within social support networks for long-term health and wellbeing. Therefore, consideration should be given to the promotion of participation in social activities and community groups when treating older adults with chronic physical health conditions. Maintaining social participation and engagement as we age is critical to sustain good physical and mental health.

Conclusions

Physical disability should be the target of preventive strategies aiming to enhance wellbeing in older ages because of its close association with quality of life. Furthermore, maintaining social relationships and participation is important, but particularly so as people age and have increasing levels of functional limitations. While functional limitations may be associated with lower quality of life, supportive social networks and close relationships can change that association. Policies promoting and enabling continued social participation and engagement in older age could significantly improve health outcomes, and enhance healthy and active ageing and maintain quality of life in the ageing population.

3.5 References

1. Ward M, McGarrigle CA, Kenny RA. More than health: quality of life trajectories among older adults-findings from The Irish Longitudinal Study of Ageing (TILDA). *Quality of life research: an international journal of quality of life aspects of treatment, care and rehabilitation*. 2018.
2. McCrory C, Leahy S, McGarrigle CA. What Factors are Associated with Change in Older People's Quality of Life? In: Nolan A, O'Regan C, Dooley C, Wallace D, Hever A, Cronin H, et al., editors. *The Over 50s in a Changing Ireland Economic Circumstances, Health and Well-Being*. Dublin: The Irish Longitudinal Study on Ageing; 2014.
3. Kamiya Y, Murphy C, Savva G, Timonen V. *Profile of Community-Dwelling Older People with Disability and their Caregivers in Ireland*. Dublin: The Irish Longitudinal Study on Ageing; 2012. http://tilda.tcd.ie/publications/reports/pdf/Report_CaregiversProfile.pdf

4. Barry LC, Soulos PR, Murphy TE, Kasl SV, Gill TM. Association between indicators of disability burden and subsequent depression among older persons. *The Journals of gerontology Series A, Biological Sciences and Medical Sciences*. 2013;68(3):286-92.
5. Sexton E, King-Kallimanis BL, Layte R, Hickey A. CASP-19 special section: how does chronic disease status affect CASP quality of life at older ages? Examining the WHO ICF disability domains as mediators of this relationship. *Aging Ment Health*. 2015;19(7):622-33.
6. Burholt V, Scharf T. Poor health and loneliness in later life: the role of depressive symptoms, social resources, and rural environments. *The Journals of Gerontology Series B, Psychological Sciences and Social Sciences*. 2014;69(2):311-24.
7. Seeman TE. Social ties and health: the benefits of social integration. *Annals of epidemiology*. 1996;6(5):442-51.
8. Nieminen T, Harkanen T, Martelin T, Borodulin K, Koskinen S. Social capital and all-cause mortality among Finnish men and women aged 30-79. *European Journal of Public Health*. 2015;25(6):972-8.
9. Holt-Lunstad J, Smith TB, Layton JB. Social relationships and mortality risk: a meta-analytic review. *PLoS Medicine*. 2010;7(7):e1000316.
10. Wahrendorf M, Siegrist J. Are changes in productive activities of older people associated with changes in their well-being? Results of a longitudinal European study. *Eur J Ageing*. 2010;7(2):59-68.
11. Windsor TD, Anstey KJ. Age differences in psychosocial predictors of positive and negative affect: a longitudinal investigation of young, midlife, and older adults. *Psychology and Aging*. 2010;25(3):641-52.
12. McMunn A, Nazroo J, Wahrendorf M, Breeze E, Zaninotto P. Participation in socially-productive activities, reciprocity and wellbeing in later life : baseline results in England. *Ageing & Society*. 2009;29:765-82.
13. Santini ZI, Koyanagi A, Tyrovolas S, Haro JM. The association of relationship quality and social networks with depression, anxiety, and suicidal ideation among older married adults: Findings from a cross-sectional analysis of the Irish Longitudinal Study on Ageing (TILDA). *Journal of Affective Disorders*. 2015;179:134-41.

14. Sexton E, King-Kallimanis BL, Conroy RM, Hickey A. Psychometric evaluation of the CASP-19 quality of life scale in an older Irish cohort. *Quality of Life Research*. 2013;22(9):2549-59.
15. Jivraj S, Nazroo J. Determinants of socioeconomic inequalities in subjective well-being in later life: a cross-country comparison in England and the USA. *Quality of Life Research*. 2014;23(9):2545-58.
16. Carr D, Freedman VA, Cornman JC, Schwarz N. Happy Marriage, Happy Life? Marital Quality and Subjective Well-Being in Later Life. *Journal of Marriage and the Family*. 2014;76(5):930-48.
17. Kamiya Y, Doyle M, Henretta JC, Timonen V. Depressive symptoms among older adults: the impact of early and later life circumstances and marital status. *Aging Ment Health*. 2013;17(3):349-57.
18. Berkman LF, Glass T, Brissette I, Seeman TE. From social integration to health: Durkheim in the new millennium. *Social Science & Medicine*. 2000;51(6):843-57.
19. House J, Robbins C, Metzner H. The association of social relationships and activities with mortality: Prospective evidence from the Tecumseh Community Health Study. *Am J Epidemiol*. 1982;116:123-40.
20. Torres JL, Lima-Costa MF, Marmot M, de Oliveira C. Wealth and Disability in Later Life: The English Longitudinal Study of Ageing (ELSA). *PloS one*. 2016;11(11):e0166825.
21. Grundy E, Glaser K. Socio-demographic differences in the onset and progression of disability in early old age: a longitudinal study. *Age Ageing*. 2000;29(2):149-57.
22. Gjonca E, Tabassum F, Breeze E. Socioeconomic differences in physical disability at older age. *Journal of Epidemiology and Community Health*. 2009;63(11):928-35.