**The psychosocial benefits of providing non-kin childcare in older adults: A longitudinal study with older New Zealanders**

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**Acknowledgments**

This work was funded by the New Zealand Foundation for Research, Science, & Technology (MAUX0401). This research project was approved by the School of Psychology’s Human Ethics Committee at Massey University. The authors declare no conflicts of interest.

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**Abstract**

Community grandparenting may promote the wellbeing of older adults. We examined the impact of non-kin and grandparental childcare on quality of life and loneliness using longitudinal data from 2653 older New Zealanders collected over two years. Providing both non-kin and grandparental childcare predicted greater self-realization for women only and was associated with reduced levels of control and autonomy for men. Non-kin childcare was also associated with reduced social loneliness over time independent of gender. Findings suggest that non-kin grandparenting has psychosocial benefits for older adults. Surrogate grandparenting offers promising avenues for those without grandchildren to experience the benefits of grandparenting.

*Keywords: community grandparenting, quality of life, loneliness, ageing, volunteering*

Nurturing and providing care are evolutionary mechanisms that have contributed to human survival across centuries. The carer and the cared-for flourish from the reciprocal need for human connection, which is common across ethnicity and race (Sommer, Samuelsson, & Hundeide, 2010). Providing nurturance to others across the life course most formally occurs in parenting and progresses to grandparenting. Grandparenting has been linked to a range of beneficial health outcomes for older adults, including increased cognitive functioning (Sneed & Schulz, 2017), lower rates of depression (Grundy et al., 2012; Chung & Park, 2017), and greater subjective wellbeing (Mahne & Huxhold, 2014). Although studied less often, initial evidence indicates that grandparenting beyond the family, also known as non-kin grandparenting, is associated with similar benefits, such as less cognitive impairment and decline, lowered risk for depression (Trevisan et al., 2018) and reduced mortality (Hilbrand, Coall, Gerstorf, & Hertwig, 2017). In the present study, we aim to contribute to research on non-kin grandparenting by investigating the benefits of providing non-kin childcare not only for the psychological (assessed in terms of quality of life), but also for the social wellbeing (assessed in terms of emotional and social loneliness) of older adults.

**Non-kin Grandparenting: A Form of Productive Engagement**

Non-kin caregiving may be understood as a form of volunteering that is mutually beneficial to older adults and their respective communities (Kincade et al., 1996). Volunteering by older adults has been associated with improved self-efficacy, greater social connectedness, reduced loneliness, greater cognitive activity, reduced risk for dementia and lowered mortality (Anderson et al., 2014; Harris & Thoresen, 2005). Litwin and Shiovitz-Ezra (2006) further emphasise that we need to pay attention to the quality and scope for agency in voluntary activities for them to be meaningful and interesting to enhance older adults’ wellbeing. Given that many older adults have parented or provided care in some form for children in their lives, it is likely that they have existing skills in childcare. The benefits of non-kin grandparenting are still largely unrecognised within the older adult voluntary sector, although it has recently begun gaining momentum in practice through initiatives such as surrogate grandparenting programs that aim to connect older adults without grandchildren and families in need for grandparental support (Jarrott & Weintraub, 2009).

While from a Western perspective non-kin grandparenting is conceptualised as a form of volunteering, in Indigenous communities, where Elders are considered to be guardians of cultural knowledge, older adults continue to have a primary role in nurturing children and transmitting cultural values to younger generations (Ofahengaue Vakalahi, Toafa, & Moala, 2008; Viscogliosi et al., 2017; Warburton & Chambers, 2017). In New Zealand, Indigenous Māori employ the concepts of ‘whānau’ (extended family or community) and ‘whanaungatanga’ (kinship, sense of connection, relationship through shared experiences and working together)to encapsulate the value of connectedness and multigenerational reciprocity as well as the duties and expectations of care towards members of the community (Robinson & Williams, 2001). Traditionally, whānau involves immediate and extended family as well as distant relationships based on a shared ancestor. Every member of the whānau has particular obligations towards the community (Moeke-Pickering, 1996). Elders generally take on key leadership roles, which include the protection, nurturing, and teaching of children within the wider community (Durie, 1999). Reciprocity between generations and within whānau ensures that Elders participate actively in the community, their involvement is productive, and their emotional needs are fulfilled. Indigenous knowledge highlights the importance and value of caring for all children within a community, focusing on both the benefits and the need for such care to be provided.

**Community grandparenting for the 21st centur**y

 With the challenges we are facing in the 21st century, an increased uptake and promotion of non-kin grandparenting holds particular promise for two reasons. First, the world’s older population is growing at an unprecedented rate. Today, 8.5% of people worldwide are aged 65 and over and this is projected to increase to nearly 17% by 2050 (Wan, Goodkind, & Kowal, 2016). Coupled with a declining fertility rate in Western countries, this means that a growing number of older adults will be without grandchildren. Secondly, globalisation increasingly sees families living in different states and countries, far from grandparental support (Hilbrand et al., 2017). As a result, many grandparents are not able to contribute to their grandchildren’s lives on an everyday basis, which can increase social and emotional loneliness (Drew & Silverstein, 2007). However, non-kin childcare provides an alternative for older persons without grandchildren (or regular contact with grandchildren) to derive the benefits demonstrated by grandparenting for kin.

**Present Study**

In the present study, we explored the benefits of community grandparenting for older adults’ wellbeing. Using longitudinal data, we investigated whether providing care for non-kin children was associated with increased quality of life and reduced social and emotional loneliness over time. We compared findings between grandparental and non-kin childcare to explore whether the psychosocial benefits of non-kin care were comparable to that of grandparental care. Further, we examined the potential for cumulative benefits for those providing both grandparental and non-kin childcare.

We also tested differences based on ethnicity, gender, and working status. As discussed above, providing care for children in the broader community is central to Māori cultural practices; therefore, we expected that childcare (both non-kin and grandparental) would be more prevalent among Māori. Evolutionary caregiving systems evolved with women playing a primary role in providing care for children and facilitating intergenerational relationships (Brown, Brown, & Preston, 2011). Consequently, we predicted that women would be more likely to engage in both grandparental and non-kin childcare than men. While non-kin childcare is likely to present psychosocial benefits for all, we expected that its influence on quality of life outcomes would be greater for women. Childrearing activities (both grandparental and non-kin) can also provide a productive way for older adults transitioning out of the workforce to make non-monetary contributions to their communities (Gonzales, Matz-Costa, & Morrow-Howell, 2015). We hypothesized that grandparental and non-kin childcare would not only be more prevalent among those who retired, but they would also report more psychosocial benefits over time when providing non-kin care.

**Method**

**Participants**

Data were drawn from the 2010-2012 waves of the New Zealand Health, Work and Retirement Study (NZHWR). The NZHWR is a prospective longitudinal cohort study surveying New Zealanders aged 55 years and older every two years via postal surveys (for more information on sampling, data collection and design, see Towers, Stevenson, Breheny, & Allen, 2017). Ethical approval for the study was provided by [removed for blind review] and informed consent was obtained from all participants. The 2010 data collection wave was the first time that quality of life and loneliness were included in the survey along with information collected on kin and non-kin childcare. The current sample included 2653 New Zealanders (55% female, 30% of Māori descent) with an average age of M = 64 years (*SD* = 8 years), who responded to both the 2010 and 2012 surveys. Most participants were married or in a de facto relationship (75%) and employed (62%) (Table 1).

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**Measures**

Scale properties, response options, and internal reliability are reported in Table 2.

**Dependent variables: Quality of life and loneliness**

The *CASP-12* assesses quality of life in old age in three conceptual domains: capacity to achieve control and autonomy (6 items), self-realization (3 items), and pleasure (3 items; Wiggins, Netuveli, Hyde, Higgs, & Blane, 2008). Items, such as ‘I feel that my life has meaning’, are answered on a 4-point scale anchored at 0 = never to 3 = often. A composite score is created for each subscale with higher scores indicating greater control and autonomy (range: 0-18), pleasure (range: 0-9) and self-realization (range: 0-9). The short-form *De Jong Gierveld Loneliness Scale* assesses social and emotional loneliness with three items for each category (de Jong Gierveld & Van Tilburg, 2006). Responses to items, such as ‘I miss having people around’ and ‘There are many people I can trust completely’, are given on a 3-point scale (‘yes’, ‘more or less’ and ‘no’). Responses in the loneliness direction (i.e., ‘yes’ and ‘more or less’) receive a score of 1. A composite score is created for social (range: 0-3) and emotional loneliness (range: 0-3).

**Independent variable: Childcare**

Participants answered two questions regarding childcare: whether they provided unpaid childcare for grandchildren and for other people’s children. Responses were provided on a 4-point scale for both questions (1 = yes, daily, 2 = yes, weekly, 3 = yes, occasionally, and 4 = no never). In addition, there was an option to indicate if someone did not have grandchildren. On both questions, ‘yes’ responses regardless of frequency of care were categorized to indicate childcare and a ‘no’ response was categorized as no childcare. Based on responses to both questions, four categories were created: no childcare (*n* = 1051), non-kin childcare only (*n* = 204), grandparenting only (*n* = 903), and grandparenting combined with non-kin childcare (*n* = 495).

**Demographic, socioeconomic and health-related control variables**

Demographic controls were age, gender, ethnicity, and marital status. Socioeconomic indicators included education, retirement status, and the short-form economic living standards index (ELSI-SF). The ELSI-SF is a New Zealand specific, non-monetary measure of socioeconomic status (Jensen, Spittal, Crichton, Sathiyandra, & Krishnan, 2002). It consists of 25 items assessing limitations in social participation (e.g., cannot afford to have family or friends over for a meal) and living conditions (e.g., not having electricity in the house) due to financial restrictions, economising behaviour (e.g., staying in bed for warmth), financial difficulties (e.g., inability to pay utility bills), and self-reported satisfaction with income and living standards. By summing all items, a composite score is created that ranges from 0 to 31 with higher scores indicating greater economic living standards. Health status was assessed with the SF-12 Health Survey (Ware, Keller, & Kosinski, 1998). Mental and physical health component scores were calculated based on normative scores derived for the New Zealand population (Frieling, Davis, & Chiang, 2013). Scores range from 0 to 100, where 50 corresponds with the population mean (*SD* = 10).

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**Statistical Analyses**

Baseline differences across childcare categories were tested using χ2 or ANOVA.. Path analysis was performed in Mplus to investigate the impact of grandparenting and non-kin childcare on aspects of quality of life and loneliness over time. Dependent variables were residualized by regressing time 2 scores on time 1 scores, to measure change over time in quality of life and loneliness. Analyses controlled for demographic characteristics, socioeconomic factors, and self-rated health. Interaction terms were included between childcare categories and ethnicity, gender and retirement status. Missing data were handled with full informational maximum likelihood estimation.

**Results**

**Baseline Differences**

Demographic description of the total sample and by childcare category is presented in Table 1 along with baseline differences in the study variables. Those providing non-kin childcare only were significantly younger and in better physical health than the rest of the groups. They were also more likely to be Non-Māori (New Zealanders of European descent), working and have a tertiary education. Those providing both grandparental and non-kin childcare were much more likely to be Māori and have no formal educational qualification. There were differences in baseline self-realisation, pleasure, social loneliness, and emotional loneliness scores. Those providing grandparental care scored significantly higher on pleasure (*p* = .008) and self-realization (*p* = .023) and significantly lower on emotional loneliness (*p* = .014) than those providing no childcare (*p* = .008). Similarly, those providing grandparental care (*p* = .005) or grandparental care in combination with non-kin childcare (*p* < .001) scored significantly lower on social loneliness than those providing no childcare. There were no differences among the different childcare categories in quality of life and loneliness outcomes.

**Prediction of Quality of Life**

Increments in control and autonomy were predicted by greater economic living standards, better self-rated mental and physical health, younger age and higher educational qualification (Table 3). In addition, providing combined (both grandparental and non-kin) childcare had a negative influence on control and autonomy over time. However, this relationship was moderated by gender. Specifically, providing combined (both grandparental and non-kin) childcare was associated with reduced control and autonomy over time for men (β = -.060, *p* = .028), but not for women (β = -.005, *ns*).

Increments in pleasure were predicted by better self-rated mental health and higher educational qualification. There were no significant effects of childcare. Increments in self-realization were predicted by higher levels of education, and better self-rated mental and physical health. Gender and providing combined (grandparental and non-kin) childcare also interacted significantly. Providing combined (grandparental and non-kin) childcare predicted increased self-realization for women (β = .099, *p* = .001), but not for men (β = .010, *ns*).

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**Prediction of Loneliness**

Higher economic living standards, better self-rated mental health, Māori ethnicity, being in a relationship, and not working predicted decrements in social loneliness. In addition, providing non-kin childcare only and providing grandparenting care only were associated with reduced social loneliness over time, with the effect being greater for non-kin childcare. Lower levels of social loneliness and better self-rated mental health predicted reductions in emotional loneliness (Table 4).

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**Discussion**

The chief objective of the present study was to elucidate whether non-kin grandparenting was associated with psychosocial benefits for older New Zealanders. To do this, we differentiated between non-kin care, grandparental care, and providing both grandparental and non-kin care. In line with findings from the volunteering literature (Erlinghagen & Hank, 2006), providing non-kin childcare only seemed to be taken up by middle class, more highly educated older adults. Contrary to our expectations, it was more prevalent among those still working. As expected, based on cultural values related to community care (Robinson & Williams, 2001), Māori were more likely to provide care for both grandchildren and non-kin children. They also reported significantly less social isolation over time than non-Māori. However, the psychosocial benefits derived from non-kin and grandparental care did not vary across ethnic groups, even after controlling for potential confounding effects of socioeconomic and marital status.

While there were no differences between men and women in the frequency of engaging in childcare, providing grandparental care in combination with non-kin childcare was associated with growth of self-realization over time for women. Self-realization represents agency to derive happiness and a sense of fulfilment from activities and social engagement (Wiggins et al., 2008). Gender variances in fulfilment and pleasures derived from care activities have been explained twofold; from an evolutionary and a social perspective. The evolutionary explanation for women’s greater pleasure derived from altruistic forms of giving, such as grandparenting and non-kin relationships, rests upon the idea that women’s post-reproductive lifespan surpasses that of other species and is thought to exist to support younger generations in care activities. Such ancestral behaviour is seen as the explanatory factor for why women were traditionally more likely to engage in non-kin altruistic prosocial behaviour, which generated neural and hormonal circuits activated by feelings of empathy and compassion.

Given the changing social structures, however, it is likely that social explanatory factors may give us greater insight into how variances in pleasure derived from care exist. From a social perspective, we can observe that men’s involvement in childrearing has been steadily increasing over the past decades (Donnelly et al., 2016). Such a societal shift could result in men increasingly gaining greater satisfaction from childcare in years to come. Barker (2014) discusses that when men engage in care work early in life, they show ‘greater emotional honesty and empathy’ and feel more enriched by such care activities. Thus, we can see how women have been, and to a large extent still are socialized from an early age to provide care for children, which might explain why women are more likely to find engagement with children as fulfilling and derive increased happiness from it; because they do it more than men. This gender imbalance is likely to be socially caused, since men who do engage in care activities from an early age are just as likely to derive satisfaction from these activities as women. With the changing trend of men’s involvement, we could see men gaining greater benefits from non-kin childcare in the future.

Non-kin childcare alone was unrelated to changes in control and autonomy. Control and autonomy among older adults are generally influenced by economic (Szabo, Allen, Alpass, & Stephens, 2019) and health-related (Sexton, King-Kallimanis, Layte, & Hickey, 2015) factors that enable participation. This was supported in our data. Greater economic living standards, higher levels of education, and better self-reported physical and mental health were associated with increased control and autonomy over time for all participants. Non-kin childcare in combination with grandparental care was negatively associated with feelings of control and autonomy for men. Given that providing childcare has generally been the norm for women, particularly in the study generation, it is likely that women have developed capabilities for maintaining autonomy and control when providing care. In contrast, for older men, adjusting to the additional responsibilities that come with childcare for both kin and non-kin may introduce limitations to their sense of control and autonomy.

Providing grandparental or non-kin childcare was also associated with reduced social loneliness over two years independent of gender. Non-kin childcare had a greater positive impact on social loneliness than grandparental care. This suggests that for older adults who do not grandparent, providing care for a child outside the family can be protective against social isolation (Drew & Silverstein, 2007). This has important implications for interventions. While the benefits for social loneliness are clear, engagement in childcare did not appear to be protective against emotional loneliness, i.e., the absence of having intimate relationships. Interacting with children may not provide the same sense of intimacy and closeness people gain from connecting with adults.

**Strengths and Limitations**

The study contributes to the literature by highlighting the potential psychological and social benefits of non-kin or community grandparenting, an area of research that has received limited attention to date. From a methodological perspective, the main strength of the study is the use of longitudinal data collected over two years from a large sample, which allowed us to examine the extent to which non-kin grandparenting is associated with increments or decrements in indicators of quality of life and loneliness over time. Further, as the sample included a large number of Māori older adults, we were able to spotlight cultural differences in engagement in non-kin care and discuss the importance of considering cultural perspectives. It is, however, important to acknowledge that we used a simple indicator of non-kin childcare, differentiating between non-kin carers, grandparents, and non-carers. We had no information about the context of care, time spent caring per occasion, motivations to provide non-kin childcare, or how individuals define care beyond family. The central value of whānau and whanaungatanga for Māori raises the question of what counts as kin and what does not, and to what extent our definition can differentiate such a concept within a Māori worldview. For example, kin for Māori might include broader whānau (i.e., distantly related children). Future research should explore the cultural variance and differential meanings of kin between Māori and non-Māori in relation to non-kin childcare across cultures. The study assessed the benefits of non-kin care for perceived quality of life and social connectedness using self-report measures. It is unclear to what extent these benefits would be observed in objective indicators of health and wellbeing. Consideration of these factors could offer a more nuanced understanding of the role non-kin childcare plays in older adults’ quality of life social relationships, and health.

**Practical Implications**

Rather than seeing the demographic change as a challenge, productive ageing takes a solution-focused approach to ageing which sees older adults’ capacities as underdeveloped and underutilised (Gonzales, Matz-Costa, & Morrow-Howell, 2015), and thus moves away from the typical deficit framing of older people (Stephens & Flick, 2010). Productive engagement is defined as any paid or unpaid activity that produces a service or good for society (Gonzales et al., 2015). Non-kin grandparenting holds promise to contribute to such a strengths-based perspective by valuing the non-monetary assets older adults already add to society. Further, unstable social structures, changing gender roles, and increasing geographical mobility of families, may pose non-kin grandparenting as an important avenue for enabling older adults to engage in grandparenting activities and for families to receive the grandparental support many are currently missing as we progress through the 21st century.

Intergenerational programs have already shown the benefits non-kin grandparenting can have for older adults and children alike (Aemmi & Karimi Moonaghi, 2017; Fujiwara et al., 2009), providing promising prospects for fostering sustainable and connected communities in the future (Buffel et al., 2014). Beyond the possible health benefits offered to individuals involved in non-kin childcare, there are also tangible community and societal implications to consider. For instance, local exchange trading systems (LETS, transaction based systems for non-monetary community exchanges with community-building, economic and social equity objectives) have unique potential to include non-kin childcare into their trading systems. Such initiatives have the potential to fulfil unmet needs of young families and older people, whilst simultaneously building community capacity, connectedness and wellbeing (Collom, 2008; Lasker et al., 2011). Time banking, one commonly used LETS currency, enables members to exchange goods and services based on the time involved. Lasker et al. found that time banking enabled the participation of hard-to-reach populations, such as those disabled, economically disadvantaged, or older people. Thus, populations that are less likely to engage in voluntary activities may be able to engage more readily in LETS schemes, and gain the benefits that come with such initiatives, such as a greater sense of community, reciprocity and trust (Kwon, Lee & Xiao, 2019; Lasker et al., 2011). By introducing non-kin grandparenting as part of a LETS, in addition to gaining greater quality of life and sense of purpose, older adults could also use their earned ‘credits’ to receive help in areas they may struggle to maintain, such as gardening or heavy lifting. Given the myriad of benefits non-kin grandparenting may hold, the initial evidence reported in this paper invites researchers to further explore current approaches, and future potential for community grandparenting.

**Conclusions**

Overall, our findings provide support for non-kin childcare’s capacity to promote quality of life in older women and diminish feelings of social loneliness over time in both older men and women. The benefits of non-kin childcare for social loneliness were observed above and beyond grandparenting. For quality of life, however, the positive effects only existed in combination with grandparental care. This highlights that while non-kin childcare might not have the same psychological effects as grandparenting, it has potential for improving the social health of the older adult population. With the changing societal structures of men’s greater involvement in childcare, an ageing population and dispersed families across the globe, non-kin grandparenting holds great promise in filling needs across multiple social groups. Our study has hinted at an opportunity that has thus far not been explored in great depth and could, if explored further, support practitioners and policy makers to actively consider non-kin grandparenting as a tool.

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Table 1. *Descriptive statistics of the sample and baseline differences between non-kin carers and non-carers.*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|   | Total sample | Non-carer | Non-kin care  | Grand-parenting | Combined childcare |   | Test of differences across childcare groups |
| **Demographic factors** |  |  |  |  |  |  |  |
| Age: M (SD) | 64 (8) | 64 (8) | 59 (8) | 67 (7) | 64 (7) |  | *F*(3, 2649) = 66.48, *p* < .001 |
| Gender |  |  |  |  |  |  |  |
| Male | 44.9% | 47.7% | 43.8% | 43.9% | 41.4% |  | χ2(3) = 6.34, *ns* |
| Female | 55.1% | 52.3% | 56.2% | 56.1% | 58.6% |  |  |
| Ethnicity |  |  |  |  |  |  |  |
| Non-Māori | 69.5% | 77.1% | 75.9% | 67.8% | 54.0% |  | χ2(3) = 85.68, *p <* .001, *V* = .18 |
| Māori | 30.5% | 22.9% | 24.1% | 32.2% | 46.0% |  |  |
| Marital status |  |  |  |  |  |  |  |
| Married or de facto | 74.6% | 69.9% | 71.9% | 80.3% | 75.1% |  | χ2(3) = 28.25, *p* < .001, V = .10 |
| Not married or de facto | 25.4% | 30.1% | 28.1% | 19.7% | 24.9% |  |  |
| **Socioeconomic status** |  |  |  |  |  |  |  |
| Education |  |  |  |  |  |  |  |
| No qualifications | 25.0% | 22.5% | 11.8% | 28.0% | 30.3% |  | χ2(9) = 41.68, *p <* .001, V = .13 |
| Secondary school | 22.4% | 22.9% | 24.5% | 23.1% | 19.3% |  |  |
| Post-secondary/trade | 26.8% | 27.7% | 27.9% | 26.5% | 25.2% |  |  |
| Tertiary | 25.8% | 27.0% | 35.8% | 22.5% | 25.2% |  |  |
| Work status |  |  |  |  |  |  |  |
| Working | 61.7% | 64.6% | 79.8% | 52.6% | 64.7% |  | χ2(1) = 8.66, *p* = .003, *V* = .06 |
| Retired | 38.3% | 35.4% | 20.2% | 47.4% | 35.3% |  |  |
| Economic living standards: M (SD) | 23.57 (6.33) | 23.95 (6.33) | 23.20 (6.54) | 24.11 (5.72) | 21.92 (7.03) |  | *F*(3, 2555) = 14.47, *p* < .001 |
| **Self-rated health** |  |  |  |  |  |  |  |
| SF-12 Physical health: M (SD) | 46.54 (10.43) | 47.43 (10.49) | 49.71 (9.16) | 45.73 (10.41) | 44.78 (10.39) |  | *F*(3, 2383) = 14.04, *p* < .001 |
| SF-12 Mental health: M (SD) | 50.10 (9.66) | 49.67 (9.94) | 49.41 (9.17) | 51.10 (9.10) | 49.47 (10.12) |  | *F*(3, 2383) = 4.46, *p* = .004 |
| **Outcome measures 2010** |  |  |  |  |  |  |  |
| CASP-12 Control & Autonomy: M (SD)  | 12.99 (3.07) | 13.09 (3.17) | 12.95 (2.86) | 13.02 (3.01) | 12.74 (3.03) |  | *F*(3, 2600) = 1.45, ns |
| CASP-12 Pleasure: M (SD) | 8.28 (1.45) | 8.16 (1.51) | 8.33 (1.36) | 8.37 (1.39) | 8.36 (1.43) |  | *F*(3, 2626) = 4.09, *p* = .007 |
| CASP-12 Self-realisation: M (SD) | 7.03 (1.95) | 6.88 (2.09) | 7.28 (1.84) | 7.13 (1.84) | 7.07 (1.87) |  | *F*(3, 2622) = 4.04, *p = .007* |
| Social Loneliness: M (SD) | 1.28 (1.21) | 1.40 (1.23) | 1.33 (1.20) | 1.22 (1.17) | 1.10 (1.19) |  | *F*(3, 2636) = 8.20, p *< .001* |
| Emotional Loneliness: M (SD) | 0.59 (0.89) | 0.66 (0.95) | 0.53 (0.84) | 0.53 (0.84) | 0.58 (0.88) |  | *F*(3, 2630) = 3.44 p = .016 |

Table 2. *Scale properties: Number of items, response options, coding procedure, maximum range, and scale reliability*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | Items | Response options | Coding | Range | α |
| Demographic controls |  |  |  |  |  |
| Gender | 1 | (0) male; (1) female | - | 0-1 | - |
| Ethnicity | 1 | (0) Non-Māori; (1) Māori | - | 0-1 | - |
| Marital status | 1 | (0) not married, nor de facto; (1) married or de facto  | - | 0-1 | - |
| Socioeconomic status |  |  |  |  |  |
| Working status | 1 | (0) not working; (1) retired | - | 0-1 | - |
| Education | 1 | (1) no qualification; (2) secondary; (3) post-secondary/trade; (4) tertiary | - | 1-4 | - |
| Economic living standards | 25 | combination of 3-, 4- and 5-point Likert scales | Scoring by Jensen et al. (2005) | 0-31 | .90 |
| Self-rated health |  |  |  |  |  |
| Physical health | 6 | combination of 3- and 5-point Likert scales | Scoring by Ware et al. (1998) and Frieling et al. (2013) | 0-100 | .86 |
| Mental health | 6 | 0-100 | .79 |
| Grandparental care | 1 | (0) never; (1) occasionally; (2) weekly; (3) daily | 0 = 0; 1, 2 and 3 = 1 | 0-1 |  |
| Non-kin childcare | 1 | (0) never; (1) occasionally; (2) weekly; (3) daily | 0 = 0; 1, 2 and 3 = 1a | 0-1 | - |
| Loneliness |  |  |  |  |  |
| Social loneliness | 3 | (0) no; (1) more or less; (2) yes | 0 = 0; 1 and 2 = 1; Sum score | 0-3 | .76 |
| Emotional loneliness | 3 | 0-3 | .66 |
| Quality of life |  |  |  |  |  |
| Control and autonomy | 6 | (0) never; (1) not often; (2) sometimes; (3) often | Sum score | 0-18 | .66 |
| Pleasure | 3 | 0-6 | .84 |
| Self-realization | 3 | 0-6 | .83 |

*Note.* a: As 94% of those who engaged in non-kin childcare did it ‘occasionally’, we combined ‘occasionally’, ‘weekly’, and ‘daily’ responses.

Table 3. *Prediction of quality of life over time*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Control 2012 |  | Pleasure 2012 |  | Self-realization 2012 |
|  | *β* | *p* |  | *β* | *p* |  | *β* | *p* |
| **Quality of life in 2010** |  |  |  |  |  |  |  |  |
| Control | 0.42 | <.001 |  | 0.10 | .002 |  | 0.14 | <.001 |
| Pleasure | 0.01 | .780 |  | 0.32 | <.001 |  | 0.03 | .362 |
| Self-realization | 0.05 | .090 |  | 0.05 | .175 |  | 0.39 | <.001 |
| **Demographic characteristics** |  |  |  |  |  |  |  |  |
| Female gender | 0.04 | .423 |  | -0.07 | .318 |  | -0.09 | .153 |
| Age | -0.08 | .002 |  | 0.05 | .083 |  | -0.03 | .274 |
| Māori ethnicity | 0.01 | .939 |  | 0.08 | .315 |  | 0.10 | .155 |
| Married/de facto relationship | -0.01 | .777 |  | 0.08 | .123 |  | 0.02 | .672 |
| **Socioeconomic status** |  |  |  |  |  |  |  |  |
| Economic living standards | 0.18 | <.001 |  | 0.00 | .993 |  | 0.03 | .218 |
| Education | 0.04 | .029 |  | 0.04 | .050 |  | 0.04 | .016 |
| Retired | 0.11 | .125 |  | -0.02 | .849 |  | -0.07 | .388 |
| **Self-rated health** |  |  |  |  |  |  |  |  |
| Physical health | 0.11 | <.001 |  | 0.01 | .826 |  | 0.12 | <.001 |
| Mental health | 0.10 | <.001 |  | 0.09 | .012 |  | 0.08 | .004 |
| **Childcare**a |  |  |  |  |  |  |  |  |
| Providing non-kin childcare | -0.08 | .403 |  | 0.11 | .269 |  | 0.00 | .994 |
| Providing grandparental care | -0.03 | .670 |  | 0.06 | .406 |  | 0.05 | .469 |
| Providing combined care | -0.24 | .008 |  | 0.07 | .479 |  | 0.01 | .901 |
| **Interactions** |  |  |  |  |  |  |  |  |
| Gender x non-kin childcare | -0.01 | .669 |  | 0.02 | .413 |  | 0.03 | .291 |
| Gender x grandparenting | 0.01 | .712 |  | 0.05 | .184 |  | 0.02 | .549 |
| Gender x combined care | 0.06 | .048 |  | 0.06 | .099 |  | 0.06 | .035 |
| Māori x non-kin childcare | 0.01 | .534 |  | 0.00 | .882 |  | 0.00 | .999 |
| Māori x grandparenting | 0.05 | .107 |  | 0.02 | .498 |  | 0.01 | .846 |
| Māori x combined care | 0.03 | .379 |  | 0.03 | .395 |  | -0.01 | .655 |
| Retired x non-kin childcare | 0.01 | .537 |  | 0.01 | .592 |  | 0.01 | .588 |
| Retired x grandparenting | 0.01 | .806 |  | -0.02 | .647 |  | -0.01 | .804 |
| Retired x combined care | 0.02 | .521 |  | 0.02 | .497 |  | 0.03 | .271 |

*Note. a: reference group was ‘not providing any childcare’*

Table 4. *Prediction of social and emotional loneliness over time*

|  |  |  |  |
| --- | --- | --- | --- |
|  | Social loneliness 2012 |  | Emotional loneliness 2012 |
|  | *β* | *p* |  | *β* | *p* |
| **Loneliness in 2010** |  |  |  |  |  |
| Social loneliness | 0.50 | <.001 |  | 0.09 | <.001 |
| Emotional loneliness | 0.04 | .059 |  | 0.46 | <.001 |
| **Demographic characteristics** |  |  |  |  |  |
| Female gender | -0.09 | .137 |  | 0.09 | .132 |
| Age | 0.00 | .876 |  | 0.02 | .427 |
| Māori ethnicity | -0.17 | .024 |  | -0.11 | .131 |
| Married/de facto relationship | -0.11 | .015 |  | -0.06 | .261 |
| **Socioeconomic status** |  |  |  |  |  |
| Economic living standards | -0.09 | <.001 |  | -0.04 | .141 |
| Education | 0.01 | .692 |  | -0.01 | .520 |
| Retired | -0.15 | .045 |  | -0.07 | .387 |
| **Self-rated health** |  |  |  |  |  |
| Physical health | -0.02 | .447 |  | -0.06 | .009 |
| Mental health | -0.07 | .002 |  | -0.12 | <.001 |
| **Childcare**a |  |  |  |  |  |
| Providing non-kin childcare | -0.25 | .032 |  | 0.11 | .377 |
| Providing grandparental care | -0.16 | .031 |  | -0.02 | .830 |
| Providing combined care | -0.15 | .145 |  | -0.04 | .717 |
| **Interactions** |  |  |  |  |  |
| Gender x non-kin childcare | 0.02 | .471 |  | -0.02 | .609 |
| Gender x grandparenting | 0.02 | .541 |  | -0.06 | .094 |
| Gender x combined care | 0.00 | .901 |  | -0.05 | .165 |
| Māori x non-kin childcare | 0.02 | .350 |  | -0.01 | .533 |
| Māori x grandparenting | 0.05 | .102 |  | -0.01 | .689 |
| Māori x combined care | 0.03 | .281 |  | 0.04 | .214 |
| Retired x non-kin childcare | 0.04 | .117 |  | 0.00 | .977 |
| Retired x grandparenting | 0.02 | .460 |  | 0.01 | .750 |
| Retired x combined care | -0.02 | .540 |  | 0.00 | .897 |

*Note. a: reference group was ‘not providing any childcare’*