

Research Article

Profiles of Loneliness in the Caregiving Unit

Liat Ayalon, PhD*

Louis and Gabi Weisfeld School of Social Work, Bar Ilan University, Ramat Gan, Israel.

*Address correspondence to Liat Ayalon, PhD, Louis and Weisfeld School of Social Work, Bar Ilan University, Ramat Gan 52900, Israel. E-mail: liatayalon@gmail.com

Received November 19 2013; Accepted April 7 2014.

Decision Editor: Rachel Pruchno, PhD

Abstract

Purpose of the Study: The study evaluated profiles (a typology) of loneliness within the caregiving unit, which was composed of an older care recipient with functional impairment, a family member, and a home care worker.

Design and Methods: Overall, 223 complete caregiving units completed the 3-item Revised-University of California San Francisco Loneliness scale. Latent profile analysis was used to identify profiles of loneliness within the caregiving unit. Subsequently, latent profile membership was used as a between-subject variable to examine correlates of the latent profiles.

Results: A 2-profile solution was deemed most plausible. This classification consisted of a large (174 caregiving units; 78%) more favorable profile in terms of loneliness and a smaller (49 caregiving units; 22%) lonelier profile. Profile classification was associated with a variety of quality of life, well-being, social relations, and sociodemographic indicators of the 3 members of the caregiving unit.

Implications: The study provides a needed recognition of the potential interdependence among members of the caregiving unit and calls for research and practice that go beyond the individual level. The assessment of loneliness at the caregiving unit can provide valuable information about at-risk units as well as about the potential effectiveness of interventions that target the entire caregiving unit.

Key Words: Social network, Spread, Loneliness, Caregiving, Home care, Family care, Aloneness

All happy families are alike; each unhappy family is unhappy in its own way. Leo Tolstoy, *Anna Karenina*

Loneliness is defined as the subjective experience of having inadequate social contacts. It is distinguished from aloneness, which represents an objective absence of social ties (Andersson, 1998; Ayalon, Shiovitz-Ezra, & Palgi, 2013; Marangoni & Ickes, 1989). The negative effects of loneliness are well documented (West, Kellner, & Moore-West, 1986). These include direct physical effects, such as impaired sleep (Aanes, Hetland, Pallesen, & Mittelmark, 2011; Kurina et al., 2011), deregulation of the inflammatory and the endocrine systems (Hackett, Hamer, Endrighi, Brydon, & Steptoe, 2012), heightened risk for developing metabolic syndromes, including cardiovascular diseases (Ong, Rothstein, & Uchino, 2012; Sorkin, Rook, & Lu, 2002), diabetes, and stroke (Whisman, 2010) and even increased risk for Alzheimer's disease (Wilson et al., 2007). In

addition to its negative physical effects, loneliness has shown to have a direct negative effect on several health behaviors including obesity (Lauder, Mummery, Jones, & Caperchione, 2006), alcoholism (Akerlind & Hörnquist, 1992), smoking (Lauder et al., 2006), and inactivity (Shankar, McMunn, Banks, & Steptoe, 2011). Moreover, a growing body of research has documented the negative affect of loneliness on one's mental health. For instance, a longitudinal study has shown that it is not depression that causes loneliness, but rather loneliness results in a heightened risk for depression (Cacioppo, Hughes, Waite, Hawkey, & Thisted, 2006). Others have identified a relationship between loneliness and suicidal ideation and even parasuicidal acts (Ayalon & Shiovitz-Ezra, 2011; Stravynski & Boyer, 2001). Research has also shown a consistent association between loneliness and mortality risk (Patterson & Veenstra, 2010; Shiovitz-Ezra & Ayalon, 2010).

Despite the fact that loneliness is portrayed as the subjective inner experience of the individual, there is considerable support to the claim that loneliness takes place within the social realm. A recent paper has shown that loneliness spreads in the social network in a contagious fashion (Cacioppo, Fowler, & Christakis, 2009). Consistently, a different study has shown that about a quarter of the variability in one's sense of loneliness is explained by one's partner's sense of loneliness as well as by the perceived quality of the relationships with one's partner (Ayalon et al., 2013).

The present study examines the experience of loneliness within the context of the caregiving unit. Specifically, the study examines whether a typology of loneliness experienced by older care recipients, their family members, and their home care workers exists. The study also examines whether the specific profiles (i.e., typologies) identified are associated with well-being, quality of life, social relations, and sociodemographic indicators.

Home Care in Israel

Israel employs a relatively generous welfare system aimed to maintain older adults in the community. Indeed, the majority of older adults live in the community and less than 4% in institutions (Brodsky, Snoor, & Beer, 2011). Currently, about 17% of all older Israelis receive governmental financial assistance aimed to support their stay in the community, with 98% of the recipients receiving financial support in the form of home care services (National Insurance Institute of Israel [NIII], 2011).

Home care workers in Israel are responsible for the provision of personal care, such as assistance with transfers and cleaning. Eligibility for home care is a function of age, financial status, and functional disability, with only those at the highest levels of dependency being eligible for a live-in migrant home care worker (Heller, 2003; NIII, 2011). Live-in home care workers in Israel are work migrants from Asia (e.g., the Philippines, India, Nepal) or East Europe (e.g., Romania, Moldavia). They live in the premises of the home care recipient and provide round the clock care. Israeli home care workers, on the other hand, usually work part time and provide care to several different care recipients (in different households) of better functional status (Ayalon, Green, Eliav, Asiskovich, & Shmelzer, 2013). Over a third of all home care services are provided by live-in migrant home care workers, and the rest is provided by live-out Israeli home care workers (NIII, 2011).

Research on home care workers in Israel has focused almost exclusively on live-in migrant home care workers (Ayalon, 2011b; Iecovich & Doron, 2012). This line of research has portrayed the relationship between the live-in migrant home care worker, the older care recipient, and his or her family members in "family-like" terms (Ayalon, 2009a). By viewing the foreigner as a "family member," the foreigner is no longer foreign, and the most intimate tasks

of personal care are perceived as being fulfilled by a "family-like" member. Moreover, social tasks are then expected to be fulfilled at no additional cost by "family-like" members (Ayalon, 2009a). These complex relationships take place at the intersection of public services provided at the most private place, within one's home (Martin-Matthews, 2007).

Loneliness Within the Home Care Arrangement

There has been almost no research on the experience of loneliness within the home care setting (Ayalon, Shiovitz-Ezra, & Paldi, 2012). One study that examined this caregiving setting has argued for high levels of loneliness among live-in migrant home care workers. The experience of loneliness was attributed to the particular working arrangement, which allows for limited exposure to social stimulation and to the sociocultural characteristics of the live-in migrant home care worker, which differentiate the worker from the older care recipient, his or her family members, and Israeli society at large (Ayalon & Shiovitz-Ezra, 2009).

Although no comparable research on the experience of loneliness among older home care recipients has been conducted, there is a reason to believe that this group experiences high levels of loneliness. This can be attributed to old age and heightened levels of cognitive and functional disability that characterize home care recipients in Israel, as well as to reasons related to the particular caregiving setting. Specifically, this setting fosters high levels of dependency between the older care recipient and his or her home care provider. As in the case of home care workers, it is expected that sociocultural and age differences between the older care recipient and the home care worker will foster high levels of loneliness (Ayalon et al., 2013). Moreover, past research has shown that once the home care worker "enters the family," family members tend to retreat by assigning social and emotional responsibilities to the home care worker (Ayalon, 2009a).

As for older adults under live-out home care in Israel, a study has shown that they report lower levels of satisfaction compared with live-in home care recipients (Iecovich, 2007). On the one hand, older adults under live-in home care are likely more impaired, and thus, might be more vulnerable to experiencing loneliness. However, this group also tends to receive round the clock care, which could potentially alleviate the experience of loneliness (Ayalon et al., 2013). Consistently, given the fact that live-out home care workers are Israeli who provide only several hours of care per week, this group might experience lower levels of loneliness than live-in migrant home care workers (Ayalon et al., 2013).

Not unique to the Israeli context, research has shown that family caregivers may experience high levels of loneliness (Beeson, Horton-Deutsch, Farran, & Neundorfer, 2000). This has been attributed to their high levels of involvement with the care recipient. Under some circumstances, such as the provision of care to older adults with

dementia, the stigma associated with the condition might hamper the social ties of family caregivers even further (MacRae, 1999; Werner & Heinik, 2008).

The Present Study

Given past research, it is expected that loneliness would be a common experience for all members involved in this caregiving arrangement. However, less is known about the distribution of loneliness within this caregiving arrangement and whether a typology of loneliness can be portrayed. This study is important because it provides a preliminary view of loneliness as a contextual phenomenon, which happens in the caregiving unit. By viewing the common profiles of the three members of the caregiving unit, rather than viewing each member separately, the study highlights the interdependence within this caregiving unit.

Methods

The study was funded by the NIII and approved by the ethics committee of the principal investigator's university. A random stratified sample of older care recipients of 70 years or older who live in the center of Israel was drawn from the national pool of 15,564 older care recipients who receive financial assistance from the NIII in the designated geographical area. Eligibility criteria for inclusion were as follows: care recipient is of 70 years or older, lives in the center of Israel, speaks Hebrew or Russian, and meets the eligibility criteria for employing a migrant home care worker (as only the most impaired older care recipients are eligible to employ a migrant home care worker). Corresponding primary caregivers based on the records of the NIII or based on the reports of the care recipients were invited to participate, provided they spoke Hebrew or Russian. Home care workers who spoke Hebrew, English, or Russian were also eligible to participate in the study.

Eligible older care recipients and family members received a letter, inviting them to participate in the study. Subsequent phone calls aimed to schedule a face-to-face interview and obtain the contact details of the home care worker were placed to all interested parties. Because the NIII does not keep records of home care workers, home care workers were contacted only by phone, following the approval of a family member or an older care recipient, who provided the research assistant with contact details. Face-to-face interviews were conducted by trained research assistants at the time and place desired by the respondent. We explicitly attempted to interview each participant separately. For details concerning the recruitment process, see (Ayalon et al., 2013).

Our purpose was to sample complete caregiving units, which consist of an older care recipient, a family caregiver, and a home care worker all from the same unit. However, given the inherent difficulties in sampling the entire caregiving unit (Ayalon, 2011b), we settled for interviewing any member of the unit, even when other members were not

interviewed. As such, the present study is based on a sample of 686 family members, 388 older care recipients, and 523 home care workers. These represent 818 caregiving units (49.4% response rate out of the total of 2,014 caregiving units contacted). Although the study was limited to those eligible to employ a live-in migrant home care worker, only 65% of the caregiving units selected a live-in migrant home care worker and the rest had a live-out Israeli home care worker. See Figure 1 for sample flow and Table 1 for demographic characteristics of the sample.

Measures

To evaluate the psychometric properties of the measures, we conducted a preliminary study (Ayalon, 2011a, 2011b). Additional measures not already available in Hebrew or Russian were back-translated. Measures were pilot-tested on three complete caregiving units, and selected items were revised based on the participants' feedback.

Loneliness

Each interviewee reported his or her level of loneliness, using the three-item Revised-UCLA (University of California San Francisco) Loneliness scale. The measure has a simplified 3-point scale response format ranging from *never or almost never to very frequently*. Respondents are asked how often they feel they lack companionship, feel left out, or feel isolated from others. The measure has demonstrated adequate concurrent and discriminant validity and adequate reliability in past research conducted in the United States (Hughes, Waite, Hawkey, & Cacioppo, 2004) and in Israel (Schachter & Zlotogorski, 1995). Consistently, in the present study, loneliness was positively correlated with burden and negatively correlated with well-being. Cronbach's alpha was .92 for older care recipients, .89 for family members, and .85 for home care workers.

Quality of Life and Well-being Indicators

Subjective Health Status

Each interviewee ranked his or her subjective health status on a 5-point scale, with a higher score representing better subjective health.

Well-being

Each interviewee ranked his or her well-being, using the World Health Organization (WHO-5). The measure includes five items that evaluate positive mood, vitality, and general interests on a 6-point scale, with a higher score indicating better well-being. Range is from 0 to 5 (Heun, Bonsignore, Barkow, & Jessen, 2001). Cronbach's alpha in the present study was .92 for older care recipients, .93 for family members, and .88 for home care workers.

MacArthur Scale of Subjective Social Status

This is a 10-rung ladder of subjective socioeconomic standing. Participants are asked to mark the rung that best

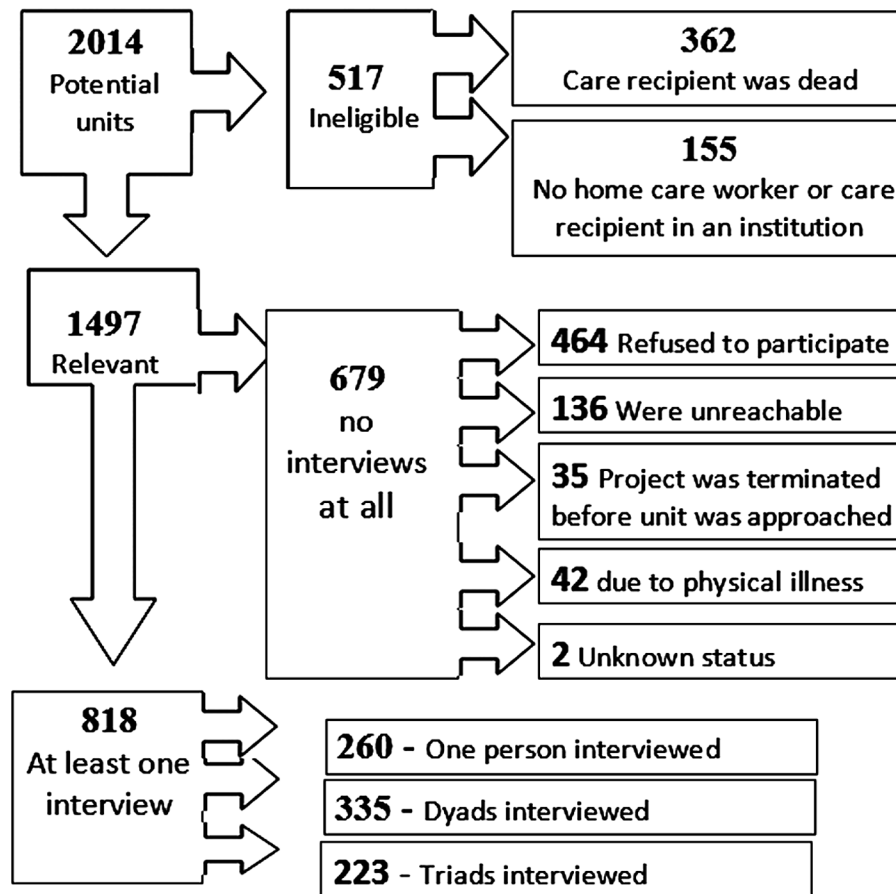


Figure 1. Sample flow. Of the 818 caregiving units, we were able to interview 223 complete caregiving units and 335 dyads (e.g., only two members of the same caregiving unit were interviewed; 66 units consisted of a family member and an older care recipient, 190 units consisted of a family member and a home care worker, and 79 units consisted of an older care recipient and a home care worker). A total of 260 caregiving units had only one person interviewed (in 21 units, only an older care recipient was interviewed; in 209 units, only a family member was interviewed; and in 29 units, only a home care worker was interviewed).

represents their social position within their community. On the top rung are the richest, most educated, and well-off individuals, whereas the poorest and worst-to-do are at the bottom of the ladder (Adler, Epel, Castellazzo, & Ickovics, 2000; Singh-Manoux, Marmot, & Adler, 2005).

Sense of Control

Respondents are asked to rank on a 10-point scale their level of perceived control over three domains: health status, financial status, and everyday life (Smith et al., 2013). In support of the validity of these items; for family members and older adults, the control items were positively correlated with well-being and negatively correlated with unmet needs. For home care workers, the three items were positively correlated with well-being, but had no significant correlation with unmet needs.

Unmet Needs

Unmet needs of the older care recipients were assessed on a seven-item scale (Ayalon, 2011a; Lowenstein, Eisikovits, Band-Winterstein, & Enosh, 2009). The original scale was built based on a review of the literature,

expert panel discussions, and preliminary piloting of the measure with 10 older adults (Eisikovits, Winterstein, & Lowenstein, 2004; Lowenstein et al., 2009). It was subsequently administered to 1,045 community dwelling older adults as part of a national survey of elder mistreatment. In preparation for use with older home care recipients, their family members, and their home care workers, several steps were taken. First, interviews with the involved parties concerning issues of elder abuse and neglect were conducted, and major themes that emerged in the interviews were examined against the existing measure (Ayalon, 2009b; Ayalon, Kaniel, & Rosenberg, 2008). An additional item concerning unmet needs for supervision was added based on findings from qualitative research with older adults and their family members (Ayalon, 2009b). The revised measure was administered to a convenience sample of family members, older adults, and home care workers. The measure demonstrated adequate concurrent validity by its association with older adults' lower financial status and lower satisfaction with the relationship with the older adult (Ayalon, 2011a).

Table 1. Sociodemographic, Well-being, Quality of Life, and Social Indicators

	Entire sample (388 older care recipients; 686 family members; 523 home care workers)	Incomplete caregiving units (165 older care recipients; 463 family members; 300 home care workers)	Complete caregiving units (223 older care recipients; 223 family members; 223 home care workers)	χ^2/t -test [<i>df</i>] incomplete units versus complete units	<i>p</i> -Value
Older care recipient					
Loneliness (1–9)	5.55 (2.24)	5.55 (2.14)	5.54 (2.31)	.06 [378]	.95
Quality of life and well-being indicators					
Subjective socioeconomic status (0–9)	4.90 (1.56)	4.95 (1.60)	4.85 (1.54)	.66 [349]	.51
Well-being (0–25)	11.79 (5.70)	11.86 (5.84)	11.77 (5.71)	.21 [379]	.84
Sense of control over health (0–10)	4.29 (2.71)	4.39 (2.81)	4.23 (2.65)	.57 [378]	.57
Sense of control over everyday life (0–10)	5.42 (2.57)	5.72 (2.68)	5.22 (2.39)	1.97 [378]	.05
Sense of control over finances (0–10)	5.46 (2.72)	5.68 (2.78)	5.17 (2.72)	2.54 [373]	.01
Subjective health (1–5)	1.44 (.63)	1.39 (.60)	1.48 (.66)	–1.31 [384]	.19
Unmet needs (0–7)	.92 (1.83)	.84 (1.71)	.99 (1.93)	–.76 [376]	.45
ADL/IADL (0–12)	7.05 (2.6)	6.44 (2.55)	7.50 (2.60)	–3.95 [348.9]	<.001
Social relations indicators					
Number of people one feels close to	2.29 (2.59)	2.06 (2.09)	2.45 (2.87)	–1.37 [345]	.17
Social engagement (1–8)	3.40 (1.35)	3.24 (1.38)	3.53 (1.33)	–2.02 [381]	.04
Satisfaction with social relations (1–3)	2.53 (.64)	2.47 (.69)	2.59 (.60)	–1.79 [378]	.07
Sociodemographic characteristics					
Age	84.30 (6.20)	84.72 (6.02)	84.0 (6.33)	1.15 [386]	.25
Woman	267 (68.8%)	117 (70.9%)	150 (67.6%)	.59 [1]	.44
Married	130 (34.1%)	47 (29.0%)	83 (37.6%)	3.27 [1]	.10
Number of years of education	10.33 (5.09)	11.16 (4.95)	9.70 (5.12)	2.58 [320]	.01
Cannot make ends meet	106 (27.7%)	46 (28.2%)	60 (27.4%)	.04 [1]	.84
Family member					
Loneliness (1–9)	4.35 (1.83)	4.49 (1.86)	4.06 (1.74)	2.97 [468.2]	.01
Quality of life and well-being indicators					
Subjective socioeconomic status (0–9)	5.19 (1.67)	5.34 (1.68)	4.90 (1.62)	3.18 [653]	<.01
Well-being (0–25)	15.84 (5.71)	15.61 (5.76)	16.34 (5.60)	–1.56 [678]	.12
Sense of control over health (0–10)	7.42 (2.54)	7.37 (2.53)	7.52 (2.56)	–.74 [677]	.46
Sense of control over everyday life (0–10)	7.99 (1.93)	7.97 (1.93)	8.05 (1.93)	–.48 [675]	.63
Sense of control over finances (0–10)	7.54 (2.66)	7.44 (2.32)	7.73 (2.14)	–1.55 [676]	.12
Subjective health (1–5)	2.82 (1.07)	2.87 (1.07)	2.70 (1.05)	1.89 [678]	.06
Social relations indicators					
Number of people one feels close to	4.29 (5.07)	4.37 (5.08)	4.12 (5.05)	.57 [623]	.57
Social engagement (1–8)	4.07 (1.43)	4.07 (1.47)	4.08 (1.34)	–.05 [680]	.96
Satisfaction with social relations (1–3)	2.62 (.57)	2.58 (.59)	2.70 (.57)	–2.81 [492.1]	<.01
Sociodemographic characteristics					
Age	60.63 (11.50)	59.68 (10.62)	62.60 (12.94)	–2.92 [371.5]	<.01
Woman	468 (69.0%)	326 (71.2%)	142 (64.5%)	3.06 [1]	.08
Married	526 (77.4%)	350 (76.4%)	176 (79.3%)	.70 [1]	.40
Number of years of education	13.63 (3.50)	13.70 (3.49)	13.49(3.51)	.70 [637]	.48

Table 1. Continued

	Entire sample (388 older care recipients; 686 family members; 523 home care workers)	Incomplete caregiving units (165 older care recipients; 463 family members; 300 home care workers)	Complete caregiving units (223 older care recipients; 223 family members; 223 home care workers)	χ^2/t -test [<i>df</i>] incomplete units versus complete units	<i>p</i> -Value
Number of caregiving tasks performed (0–12)	3.88 (3.34)	4.12 (3.42)	3.34 (3.10)	3.05 [479.4]	<.01
Relation to care recipient (spouse)	120 (17.5%)	63 (13.6%)	57 (25.6%)	14.90 [1]	<.001
Lives with the care recipient	202 (29.7%)	121 (21.3%)	81 (36.7%)	7.66 [1]	<.01
Cannot make ends meet	141 (17.2%)	97 (21.6%)	44 (20.0%)	.22 [1]	.64
Home care worker					
Loneliness (1–9)	4.82 (1.80)	4.89 (1.76)	4.71 (1.85)	1.19 [520]	.23
Quality of life and well-being indicators					
Subjective socioeconomic status (0–9)	4.23 (1.89)	4.41 (2.01)	3.99 (1.70)	2.55 [485.85]	.01
Well-being (0–25)	18.70 (4.42)	18.29 (4.61)	19.25 (4.10)	–2.45 [516]	.02
Sense of control over health (0–10)	8.36 (2.03)	8.28 (2.17)	8.47 (1.82)	–1.01 [515]	.31
Sense of control over everyday life (0–10)	8.21 (1.93)	8.20 (1.97)	8.22 (1.88)	–.13 [514]	.90
Sense of control over finances (0–10)	7.61 (2.54)	7.56 (2.62)	7.67 (2.43)	–.48 [509]	.63
Subjective health (1–5)	3.48 (.97)	3.50 (.97)	3.47 (.99)	.33 [520]	.74
Social relations indicators					
Number of people one feels close to	4.32 (5.48)	4.83 (5.92)	3.64 (4.74)	2.48 (490.3)	.01
Social engagement (1–8)	3.28 (1.19)	3.31 (1.20)	3.25 (1.18)	.53 (520)	.60
Satisfaction with social relations (1–3)	2.69 (.55)	2.68 (.56)	2.70 (.55)	–.27 (515)	.79
Sociodemographic characteristics					
Age	43.87 (11.56)	43.76 (11.37)	44.01 (11.82)	–.24 (519)	.81
Woman	450 (86.2%)	255 (85.0%)	195 (87.8%)	.86 [1]	.35
Married	299 (57.1%)	172 (57.3%)	127 (57.0%)	.01 [1]	.93
Number of years of education	11.61 (3.32)	11.57 (3.28)	11.37 (3.39)	–.33 [502]	.74
Cannot make ends meet	121 (23.4%)	71 (23.8%)	50 (22.9%)	.06 [1]	.81
Migrant home care worker	338 (64.6%)	204 (60.8%)	134 (60.1%)	3.51 [1]	.06

Note: ADL = activities of daily living; IADL = instrumental activities of daily living.

In the present study, older care recipients indicated whether they experienced unmet needs for assistance with various life domains (e.g., hygiene, transportation) over the past year. A yes–no response format was employed. Total number of “yes” responses was used as a proxy of unmet needs. Cronbach’s alpha in the present study was .89.

Functional Status

Older care recipients rated their ability to perform six activities of daily living (ADLs; eating, dressing; Katz, Downs, Cash, & Grotz, 1970) and six instrumental activities of daily living (IADLs; preparing a meal, managing finances; Lawton & Brody, 1969). The sum of impaired activities was calculated to reflect overall impairment. Range was between 0 and 12, with a higher score indicating greater impairment. Cronbach’s alpha was .76.

Social Relations Indicators

Indicators were completed by all three members of the caregiving unit in relation to their own social relations. Satisfaction with social support was evaluated on a 3-point scale, with a higher score indicating greater satisfaction. Respondents also indicated the number of people they feel close to. In addition, the number of people they have met and talked to over the phone and the frequency with which they have attended social activities (e.g., social clubs, religious groups, and so on) were averaged as an indicator of overall social engagement.

Sociodemographic Characteristics

Age, gender, education, marital status, type of home care (live-in migrant care vs. live-out Israeli care), subjective financial status (cannot make ends meet vs. enough, comfortable,

or excellent) were gathered based on self-report. Family members were also asked about their relationship to the care recipient (spouse vs. child/child in law or other) and their living arrangement (with or without the care recipient).

Informal Care

The amount of assistance in ADLs and IADLs provided by the family member to the care recipient was assessed on a 12-item scale. Range was between 0 and 12, with a higher score indicating greater assistance (Cohen et al., 2007). Cronbach's alpha was .93.

Analysis

Latent profile analysis is used to identify subtypes or profiles of related cases within a heterogeneous population. The method detects profiles of participants based on similar response patterns on a set of variables. The notion that guides latent profile analysis is that unobserved variability in the sample explains variability among observed (dependent) variables (Lubke & Muthén, 2005). In the present study, loneliness scores of each of the three members were entered as dependent variables into the mixture modeling procedure in Mplus (Muthén & Muthén, 1998–2011). Mixture modeling provides a flexible approach to detect the number of potential profiles that can be inferred from the data and to model observed variables within classes (Lubke & Muthén, 2005). The unit of analysis was the caregiving unit. Hence, loneliness scores of all three caregiving unit members were recorded on a single row (Kenny, Kashy, & Cook, 2006).

The overall goal is to achieve an adequate model fit with the lowest number of profiles, as this represents the most parsimonious solution (Lubke & Muthén, 2005). We started with a single-profile solution and increased the number of profiles until no further improvement in model fit was achieved. To determine the appropriate number of classifications, Akaike information criteria (AIC) and the Bayesian information criteria (BIC) were assessed. Lower values indicate better fitting models. Using the Lo–Mendell–Rubin-adjusted (LMR-A) likelihood ratio test, difference tests were calculated in order to determine whether an additional profile improves the fit of the model (Lo, Mendell, & Rubin, 2001). A significant *p*-value suggests that the model provides a better fit to the data compared with a model with one less profile. In addition, entropy scores were assessed. The closer the entropy score is to 1, the better the prediction is. The mean posterior probability of a case belonging to each of the classes was also evaluated. A good fitting model is expected to result in high probability of classification of a case to only one of the classifications. To ensure the stability of the models, different sets of starting values based on the local maximum in the iteration process were specified (McCutcheon, 2002). After determining profile-solution, latent profile membership was used as a between-subject variable to examine correlates of the latent profiles, using Stata 11 (StataCorp, 2009).

Missing Data

The NIII has no data concerning the characteristics of family caregivers or home care workers. Hence, we were only able to compare the care recipients' characteristics of those who participated in the study versus those who did not participate. Among older adults who agreed to participate, there were more men (123; 31.6 %) than among those who did not agree to participate (76; 22.6%, $\chi^2 = 7.33$, sig < .001). Consistently, the percentage of family members who were the relatives of older men was higher among those who agreed to participate (229; 33.2 %) than among those who did not participate (104; 24.7%, $\chi^2 = 9.06$, sig < .001).

Differences between the characteristics of members in units in which only one or two members completed the survey (i.e., incomplete caregiving units) versus members in complete caregiving units are detailed in Table 1.

When data are not missing completely at random, ignoring available information by limiting the analysis to complete caregiving units may result in biased estimates that cannot be generalizable (Acock, 2005; Blozis et al., 2013; Schafer & Graham, 2002). To account for this, data were analyzed in two ways. First, only the 223 complete caregiving units were analyzed. This is the most conservative approach that was employed following the large percentage of missing values at the caregiving unit level. Next, the entire data set (818 caregiving units) was analyzed, using multiple imputation (Asparouhov & Muthén, 2010). Multiple imputation analysis creates multiple data sets, in which the missing observations are imputed based on information from observed variables. This allows for the inclusion of auxiliary variables (i.e., variables not included in the analysis, but potentially correlated with the variables of interest or with the reasons for missing data), in the imputation process. Analysis is performed on each imputed data set separately and pooled together at the final stage. Results from the analysis of complete caregiving units are presented. Results from analysis of the entire sample, using multiple imputation are briefly noted.

Results

The fit indices of the two- and three-profile solutions were adequate, with those of the three-profile solution being somewhat better. The AIC and BIC indices of the three-profile solution demonstrated a reduction compared with the two-profile solution, whereas the entropy score was higher, suggesting that individuals are uniquely classified to one, but not to the other profiles. The significant LMR-A *p*-value also suggested that this solution was substantially better than a two-profile solution. However, one of the three profiles was very small, suggesting the possibility of low power and precision (Lubke & Neale, 2008). A four-profile solution resulted in comparable fit indices to the three-profile solution, but the LMR-A *p* value was nonsignificant, suggesting that a fourth profile was unnecessary. Because the decision concerning the number of profiles is not purely statistical, but is also theoretically grounded (Muthén &

Muthén, 1998–2011; Vermunt & Magidson, 2002), the two-profile solution is detailed in the text and the three-profile solution is briefly noted. See Table 2 for details.

Profile Solutions

The two-profile solution resulted in a large (174 caregiving units; 78%) more favorable profile in terms of loneliness and a smaller (49 caregiving units; 22%) lonelier profile. Differences in reported loneliness across the two profiles were significant for all three members of the unit. The three-profile solution demonstrated a less distinguishable pattern, consisting of a large favorable profile, in terms of loneliness and two smaller less favorable and less discernible profiles. The smallest profile is particularly notable as it was characterized by high levels of loneliness reported by older adults and family members, but not by home care workers. See Table 3 for details.

The agreement between the profile solutions obtained by using the complete caregiving unit sample versus the solutions obtained using the entire sample with multiple imputation was high, resulting in a Kappa statistic of .95 for the two-profile solution and a Kappa of 1 (i.e., perfect agreement) for the three-profile solution.

Bivariate Correlates

Bivariate Correlates of the Two-Profile Solution

A more favorable picture for the larger (less lonely) profile was portrayed in relation to many of the indicators of *quality of life, well-being, and social relations* examined in this study. Older care recipients in the more favorable profile reported a higher sense of control over everyday life and finances. They also were less likely to report unmet needs. Family members in the more favorable profile were more likely to report better subjective socioeconomic status, higher levels of well-being, a better sense of control over health, everyday life and finances, and better subjective

health. They were more socially active and satisfied with their social relationships than family members classified into the smaller, less favorable profile. Similarly, home care workers in the more favorable profile reported higher levels of well-being and a better sense of control over finances. As for *demographic characteristics*, older care recipients in the more favorable profile were more likely to be unmarried women. They were less likely to report not making ends meet. Family members in the more favorable profile were younger, more educated, less likely to live with the older care recipient or to be a spouse of the care recipient and performed fewer caregiving tasks. They also were less likely to report that they could not make ends meet. Home care workers in the more favorable profile were more likely to be migrant workers. See Table 4 for details.

Bivariate Correlates of the Three-Profile Solution

As can be seen in Table 4, with a few minor exceptions, bivariate correlates of the three-profile solution were highly comparable to those of the two-profile solution, suggesting a large more favorable profile and two smaller less favorable, but not highly distinguished profiles. This was likely due to the low number of respondents classified into the smallest profile (Lubke & Muthén, 2005). Nevertheless, of note is the smallest profile, which primarily consisted of older women and their husbands, who provided a high number of caregiving tasks and reported poor financial status. Home care workers classified into this profile were more likely to provide care for several hours per week (e.g., live-out), rather than around the clock (e.g., live-in). Results were highly consistent when the entire sample was analyzed using multiple imputation.

Discussion

The findings suggest that distinct profiles of caregiving units exist: a larger profile that is characterized by low levels of

Table 2. Fit Indices of Competing Models (Based on Complete 223 Caregiving Units)^a

Model	Log likelihood	AIC	BIC	Entropy	Mean probability of profile membership	LMR-A <i>p</i> -value
1-profile	-941.08	1894.17	1914.08			
2-profile	-865.36	1750.72	1784.80	.95	Profile 1: .99 Profile 2: .99	<.01
3-profile	-775.52	1579.04	1626.74	.99	Profile 1: 1.00 Profile 2: .99 Profile 3: 1.00	<.001
4-profile	-775.55	1516.86	1578.19	.99	Profile 1: 1.00 Profile 2: 1.00 Profile 3: .99 Profile 4: 1.00	.08

Notes: AIC = Akaike information criterion; BIC = Bayesian information criterion; LMR-A = Lo–Mendell–Rubin test-adjusted likelihood ratio.

^aLower AIC and BIC indicate better fit of the model. A higher entropy score suggests that the different profiles are more distinguishable, with a value of “1” indicating perfect classification and “0” indicating no differentiation. The addition of another profile is deemed justified when LMR-A *p* value is significant.

Table 3. Loneliness by Profile (Based on Complete 223 Caregiving Units)^a

	Profile 1	Profile 2	Profile 3	<i>t</i> [<i>df</i>]	ANOVA [<i>df</i>]	<i>p</i> -Value
A two-profile solution	49 (22%)	174 (78%)				
Care recipients' loneliness (1–9)	6.47 (2.14)	5.29 (2.30)		3.16 [215]		.01
Family members' loneliness (1–9)	7.00 (1.24)	3.24 (.56)		20.63 [53.7]		.01
Home care workers' loneliness (1–9)	5.18 (2.00)	4.57 (1.79)		2.05 [221]		.04
A three-profile solution	15 (6.7%)	46 (20.6%)	162 (72.6%)			Significant
Care recipients' loneliness (1–9)	6.93 (2.06)	6.27 (2.05)	5.22 (2.32)		6.57 [214,2]	.01; 1 < 3; 2 < 3
Family members' loneliness (1–9)	8.73 (.46)	5.91 (.66)	3.10 (.31)		1842.91 [220,2]	.001; 1 < 2, 3; 2 < 3
Home care workers' loneliness (1–9)	4.80 (2.21)	5.30 (1.89)	4.53 (1.78)		3.20 [220,2]	.04; 2 < 3

Notes: ANOVA = analyses of variance.

^a*t*-Tests and one-way ANOVAs were conducted in order to compare the two- and three-profile solutions, respectively.

loneliness of all three members and a smaller one that is characterized by relatively high levels of loneliness of all three members. This two-profile solution had a good fit to the data and resulted in two highly distinguishable profiles. Consistently, the three-profile solution, which also deemed plausible, demonstrated a distinction between a large less lonely profile and two smaller, not highly distinguishable profiles of caregiving units.

In interpreting the results of this study, it is important to keep in mind that this is a cross-sectional study that does not address the issue of cause and effect, but rather it evaluates whether indeed, certain profiles of loneliness in the caregiving unit can be drawn. In addition to the view of loneliness as “contagious,” it is possible to explain the clustering identified in the present study as a result of a common fate (Ledermann & Kenny, 2012), which suggests that all members of the caregiving unit are exposed to particular circumstances, which make them prone to loneliness. For instance, living in a poor environment might be a precipitator of loneliness among all members of the unit. A third explanation follows the logic of assortative mating, which suggests that members in the unit were similar even prior to becoming a unit (Kenny & Judd, 1986; Kenny, Mannetti, Pierro, Livi, & Kashy, 2002). For instance, family members and older care recipients might have selected workers of similar levels of loneliness to their own. Finally, it is possible that certain characteristics of the various members of the caregiving unit (e.g., marital status) affect not only the loneliness level of the person who possesses these characteristics but also the loneliness level of unit members (Kenny, Kashy, & Cook, 2006).

Consistent with past research (Beeson, 2003; Cacioppo, et al., 2006; Ekwall, Sivberg, & Hallberg, 2005), those who belonged to the more favorable profile also had more favorable quality of life and well-being indicators as well as more favorable social relations indicators. This pattern was true for all three members of the caregiving unit, suggesting that the typology of loneliness happens at the caregiving unit, rather than solely at the individual level. The largest difference between the profiles in terms of loneliness scores was for family members, suggesting that potentially, family members are

the driving force behind the profile solutions identified. The profile solutions distinguished family members on almost all measures of well-being, quality of life, and social relationships. Home care workers, in contrast, were less distinguishable across the different profile solutions. Given the fact that home care workers are indeed, external to the caregiving unit, as they represent nonfamily, this finding is expected.

Interestingly, older care recipients classified into the larger less lonely profile were less likely to report that they experienced unmet needs. This is consistent with past research that has shown a link between loneliness and elder mistreatment (Dong, Simon, Gorbien, Percak, & Golden, 2007) as well as with theoretical arguments for a link between the loneliness of formal or informal caregivers and the quality of care provided to the older care recipient (Ayalon & Shiovitz-Ezra, 2009; Ayalon et al., 2013).

Another interesting finding concerns the high percentage of older adults and family members in the lonelier profile who reported that they cannot make ends meet. Consistently, lower levels of education of family members were associated with being classified into the lonelier profile. Past research has portrayed education and income as latent social opportunities, which enable actual social relations and consequently affect one's sense of loneliness (Hawkey et al., 2008). However, because in the present study, we evaluated subjective, rather than objective income, it is possible that the association found represents a tendency toward a general negative subjective perception.

Family members in the more favorable profile provided fewer caregiving tasks and were less likely to live with the older care recipient or be the care recipient's spouse. Israeli society is a society in transition between traditionalism and modernization. On the one hand, family values and relationships are highly regarded, but on the other hand, there is a move toward greater reliance on formal care and, thus, the sole reliance on informal care to older care recipients is no longer the norm in certain sectors (Ayalon, Halevy-Levin, Ben-Yizhak, & Friedman, 2013; Sered, 1990). The study suggests that lower levels of dependency and more established physical boundaries may be beneficial for family caregivers in such a society.

Table 4. Sociodemographic, Well-being, Quality of Life, and Social Indicators by Profile (Based on Complete 223 Caring Units)^a

	A two-profile solution			A three-profile solution			$\chi^2/ANOVA$	p-Value	
	Profile 1	Profile 2	χ^2/t	p-Value	Profile 1	Profile 2			Profile 3
	49 (22%)	174 (78%)			15 (6.7%)	46 (20.6%)			162 (72.6%)
Older care recipient									
Quality of life and well-being indicators									
Subjective socioeconomic status (0-9)	4.68 (1.70)	4.89 (1.50)	-73 (197)	.46	4.00 (1.61)	4.92 (1.72)	4.89 (1.48)	1.80 (196,2)	.17
Well-being (0-25)	11.21 (5.33)	11.89 (5.69)	-71 (216)	.46	11.86 (4.42)	10.98 (5.78)	11.95 (5.67)	.53 (215,2)	.59
Sense of control over health (0-30)	3.83 (2.53)	4.33 (2.67)	-1.15 (217)	.25	4.36 (2.20)	3.31 (2.51)	4.47 (2.67)	3.46 (216,2)	.03 (3 > 2)
Sense of control over everyday life (0-30)	4.49 (2.16)	5.40 (2.42)	-2.34 (217)	.02	4.36 (1.69)	4.67 (2.38)	5.43 (2.42)	2.78 (216,2)	.06
Sense of control over finances (0-30)	4.24 (2.48)	5.41 (2.66)	-2.62 (213)	<.01	3.43 (2.46)	4.33 (2.86)	5.54 (2.60)	6.72 (212,2)	<.01 (3 < 1,2)
Subjective health (1-5)	1.61 (.79)	1.44 (.61)	1.57 (220)	.12	1.73 (1.10)	1.49 (.59)	1.46 (.62)	1.22 (219,2)	.30
Unmet needs (0-7)	1.91 (2.48)	.75 (1.68)	3.70 (214)	<.001	2.85 (3.05)	1.63 (2.25)	.67 (1.58)	11.64 (213,2)	<.001 (3 > 1,2)
ADL/IADL (0-12)	7.64 (2.49)	6.98 (2.88)	1.56 (216)	.12	8.71 (2.46)	6.57 (2.69)	7.65 (2.51)	4.81 (215,2)	<.01 (1 < 2; 3 > 2)
Social relations indicators									
Number of people one feels close to	2.37 (2.97)	2.47 (2.85)	-21 (204)	.83	2.55 (2.80)	2.05 (2.89)	2.55 (2.87)	.48 (203,2)	.62
Social engagement (1-8)	3.30 (1.38)	3.60 (1.30)	-1.38 (218)	.17	2.57 (1.38)	3.54 (1.28)	3.62 (1.30)	4.45 (217,2)	.01 (1 > 2,3)
Satisfaction with social relations (1-3)	2.45 (.66)	2.61 (.59)	-1.64 (215)	.10	2.50 (.65)	2.39 (.65)	2.65 (.58)	3.46 (214,2)	.03 (2 > 3)
Sociodemographic characteristics									
Age	84.35 (6.98)	83.89 (6.15)	.45 (221)	.66	83.30 (7.29)	83.67 (7.47)	84.15 (5.90)	.20 (220,2)	.82
Woman	27 (55.1%)	123 (70.7%)	4.22 (1)	.04	11 (73.3%)	23 (50.0%)	116 (71.6%)	7.86 (2)	.02
Married	26 (54.2%)	57 (33.3%)	6.91 (1)	<.01	8 (57.1%)	22 (47.8%)	53 (33.3%)	5.54 (2)	.06
Number of years of education	9.56 (5.52)	9.74 (5.02)	-20 (180)	.84	11.42 (5.37)	8.45 (5.79)	9.92 (4.83)	2.01 (179,2)	.14
Cannot make ends meet	20 (41.7%)	40 (23.3%)	6.41 (1)	.01	6 (42.9%)	17 (37.0%)	37 (23.1%)	5.27 (1)	.07
Family member									
Quality of life and well-being indicators									
Subjective socioeconomic status (0-9)	4.30 (1.65)	5.08 (1.57)	-3.07 (214)	<.01	4.53 (2.20)	4.37 (1.55)	5.10 (1.54)	4.05 (213,2)	.02 (3 > 2)
Well-being (0-25)	11.93 (5.56)	17.57 (4.98)	-6.82 (221)	<.001	10.00 (5.15)	12.65 (5.70)	17.96 (4.66)	34.26 (220,2)	<.01 (3 < 1,2)
Sense of control over health (0-30)	6.22 (2.62)	7.89 (2.43)	-4.15 (221)	<.001	5.53 (3.34)	6.37 (2.49)	8.03 (2.32)	13.77 (220,2)	<.01 (3 < 1,2)
Sense of control over everyday life (0-30)	7.10 (2.31)	8.31 (1.73)	-3.99 (220)	<.001	6.93 (2.80)	7.17 (2.20)	8.40 (1.63)	10.67 (219,2)	<.01 (3 > 1,2)
Sense of control over finances (0-30)	7.04 (2.22)	7.92 (2.08)	-2.58 (220)	<.001	6.93 (2.28)	7.28 (2.11)	7.93 (2.12)	2.79 (219,2)	.06
Subjective health (1-5)	2.10 (.92)	2.88 (1.02)	-4.79 (220)	<.001	1.93 (1.22)	2.30 (.81)	2.89 (1.03)	10.90 (219,2)	<.001 (3 > 1, 2)
Social relations indicators									
Number of people one feels close to	3.56 (2.89)	4.27 (5.47)	-79 (221)	.77	3.27 (2.83)	3.40 (2.80)	4.39 (5.64)	.78 (196,2)	.46
Social engagement (1-8)	3.41 (1.17)	4.26 (1.32)	-4.05 (221)	<.001	2.80 (1.30)	3.67 (1.06)	4.31 (1.32)	12.53 (220,2)	<.001 (3 < 1, 2)
Satisfaction with social relations (1-3)	2.29 (.54)	2.81 (.45)	-6.62 (219)	<.001	2.21 (.58)	2.36 (.61)	2.84 (.40)	27.65 (218,2)	<.001 (3 > 1, 2)

Table 4. Continued

	A two-profile solution			A three-profile solution			$\chi^2/ANOVA$	<i>p</i> -Value	
	Profile 1	Profile 2	χ^2/t	<i>p</i> -Value	Profile 1	Profile 2			Profile 3
	49 (22%)	174 (78%)			15 (6.7%)	46 (20.6%)			162 (72.6%)
Sociodemographic characteristics									
Age	68.73 (12.58)	60.87 (12.54)	3.88 (221)	<.001	66.53 (14.20)	67.50 (12.62)	60.85 (12.56)	5.64 (220,2)	<.01(2 < 3)
Woman	30 (62.5%)	112 (65.1%)	.11 (1)	.74	8 (53.3%)	31 (68.9%)	103 (64.4%)	1.19 (2)	.55
Married	36 (73.5%)	140 (80.9%)	1.29 (1)	.26	13 (86.7%)	32 (69.6%)	131 (81.4%)	3.56 (2)	.17
Number of years of education	11.74 (4.14)	14.00 (3.13)	-3.98 (200)	<.001	12.00 (3.82)	11.71 (4.08)	14.13 (3.09)	9.74 (199,2)	<.001 (3 > 2)
Number of caregiving tasks performed (0–12)	4.45 (3.72)	3.03 (2.84)	2.87 (221)	<.01	6.27 (4.27)	3.50 (3.26)	3.02 (2.79)	8.06 (220,2)	<.001 (1 < 2, 3)
Lives with older care recipient	30 (61.2%)	51 (29.7%)	16.37 (1)	<.001	11 (73.3%)	23 (50.0%)	47 (29.4%)	15.87 (2)	<.001
Relationship to older care recipient (spouse)	22 (44.9%)	35 (20.1%)	12.34 (1)	<.001	7 (46.7%)	17 (37.0%)	33 (20.4%)	8.95 (2)	.01
Cannot make ends meet	20 (40.8%)	24 (14.0%)	17.07 (1)	<.001	6 (40.0%)	16 (35.6%)	22 (13.8%)	14.46 (2)	<.001
Home care worker									
Quality of life and well-being indicators									
Subjective socioeconomic status (0–9)	3.70 (1.78)	4.07 (1.68)	-1.30 (210)	.20	3.71 (1.82)	3.91 (1.98)	4.03 (1.62)	.27 (209,2)	.76
Well-being (0–25)	17.73 (3.94)	19.67 (4.06)	-2.96 (218)	<.01	18.36 (4.07)	18.02 (3.97)	19.68 (4.08)	3.35 (217,2)	.04 (3 > 2)
Sense of control over health (0–10)	8.38 (1.86)	8.49 (1.81)	-.39 (219)	.70	8.60 (1.68)	8.16 (1.99)	8.54 (1.78)	.83 (218,2)	.44
Sense of control over everyday life (0–10)	8.08 (1.84)	8.26 (1.89)	-.56 (218)	.58	8.33 (1.80)	7.93 (1.86)	8.29 (1.89)	.65 (217,2)	.52
Sense of control over finances (0–10)	6.87 (2.82)	7.89 (2.27)	-2.58 (215)	.01	7.60 (2.72)	6.80 (2.74)	7.92 (2.27)	3.80 (214,2)	.02 (3 > 2)
Subjective health (1–5)	3.25 (1.02)	3.52 (.98)	-1.73 (220)	.08	3.43 (.93)	3.34 (1.10)	3.51 (.97)	.47 (219,2)	.63
Social relations indicators									
Number of people one feels close to	4.42 (4.83)	3.42 (4.72)	1.25 (208)	.21	4.64 (3.86)	4.12 (5.06)	3.41 (4.73)	.71 (207,2)	.50
Social engagement (1–8)	3.44 (1.42)	3.20 (1.10)	1.27 (221)	.21	3.78 (1.69)	3.14 (1.20)	3.24 (1.11)	1.71 (220,2)	.18
Satisfaction with social relations (1–3)	2.58 (.54)	2.73 (.55)	-1.64 (220)	.10	2.57 (.65)	2.59 (.54)	2.74 (.54)	1.81 (219,2)	.17
Sociodemographic characteristics									
Age	46.44 (11.74)	43.34 (11.79)	1.61 (220)	.10	47.00 (11.07)	45.50 (11.82)	43.33 (11.88)	1.08 (219,2)	.34
Woman	40 (83.3%)	155 (89.1%)	1.16 (1)	.28	13 (92.9%)	39 (84.8%)	143 (88.3%)	.76 (2)	.78
Married	22 (44.9%)	105 (60.4%)	3.72 (1)	.05	8 (53.3%)	22 (47.8%)	97 (59.9%)	2.21 (2)	.33
Number of years of education	11.55 (3.05)	11.70 (3.49)	-.26 (209)	.80	10.77 (3.30)	12.00 (2.80)	11.64 (3.56)	.68 (208,2)	.51
Live-in migrant worker	20 (40.8%)	114 (65.5%)	9.72 (1)	<.001	5 (33.3%)	25 (54.3%)	104 (64.2%)	6.25 (2)	.04
Cannot make ends meet	15 (31.9%)	35 (20.5%)	2.73 (1)	.10	3 (21.4%)	14 (31.1%)	33 (20.8%)	2.15 (2)	.34

Notes: ADL = activities of daily living; ANOVA = analyses of variance; IADL = instrumental activities of daily living. ^a*t*-Tests and one-way ANOVAs were conducted in order to compare the two- and three-profile solutions, respectively.

Unexpectedly, unmarried (divorce, single, or widow) older women were more likely to be classified into the larger, more favorable profile. This is somewhat inconsistent with past research that has shown that women and unmarried individuals are more likely to report loneliness than men and married individuals, respectively (Pinquart, 2003). However, the study also shows that older care recipients in the more favorable profile were more likely to rely on live-in migrant home care workers. The study raises the possibility that live-in migrant home care workers alleviate some of the loneliness experienced by older care recipients. A longitudinal study is desired in order to identify whether this is truly the case.

Consistently, the three-profile solution alludes to a small profile that is characterized by high levels of loneliness among family members and older adults, but not among home care workers. This discordance in terms of loneliness could be due to the fact that home care workers classified into this profile were likely to provide care for several hours per week (i.e., live-out). Possibly, their perceived loneliness was not as well tied with the perceived loneliness of family members and older adults, as they were not part of the family-like relationships, which tend to form with a live-in migrant home care worker (Ayalon, 2009a).

The study was limited to a maximum of three members in the caregiving unit. Future research will benefit from evaluating additional members in this unit, such as other family members, neighbors, or close friends. An expected, next step would be to explore further the origins of the profiles identified in order to develop casual explanations, using a longitudinal design. The range of the scale used to assess loneliness was limited, and as a result, the latent profile analysis was less sensitive to subgroups with inconsistent values. Future research will benefit from using a more detailed measure of loneliness, which offers a wider range of responses, such as the Revised-UCLA Loneliness scale (Russell, Peplau, & Cutrona, 1980) or the de Jong-Gierveld Loneliness scale (de Jong-Gierveld & Kamphuls, 1985).

Implications

The findings provide a preliminary evaluation of the unique patterns of loneliness in the caregiving unit. The findings demonstrate that distinct loneliness profiles can be detected and that the characteristics of all three members—family members, older care recipients, and home care workers—are distinguishable across these profiles. Awareness of profiles of the caregiving unit will sensitize practitioners to viewing the caregiving experience more holistically, in the context in which it occurs. Potentially, future interventions that target loneliness in this population should take into account the entire caregiving unit, rather than address its particular members separately. By assessing loneliness at the caregiving unit level, rather than at the individual level, one can identify potentially high-risk units of need for intervention. The association of loneliness at the caregiving unit level with many of the quality of life and well-being indicators of the individual

members provides an incentive for further research on the topic as it clearly demonstrates that processes that take place at the caregiving unit such as the experience of loneliness are directly related to the quality of life and well-being of the individual members who make up the unit.

Acknowledgment

I wish to thank Mr Ohad Green, Mrs Tami Eliav, Dr Daniel Gotlieb, Dr Sharon Asiskovitz, Mrs Miriam Shmelzer, Mr Alex Galia, Mr Shaul Nimrodi, Mrs Orel Abutbul, and Mrs Refaela Cohen for their assistance with this project.

References

- Aanes, M. M., Hetland, J., Pallesen, S., & Mittelmark, M. B. (2011). Does loneliness mediate the stress-sleep quality relation? The Hordaland Health Study. *International Psychogeriatrics*, *23*, 994–1002. doi:10.1017/s1041610211000111
- Acock, A. C. (2005). Working with missing values. *Journal of Marriage and Family*, *67*, 1012–1028. doi:10.1111/j.1741-3737.2005.00191.x
- Adler, N. E., Epel, E. S., Castellazzo, G., & Ickovics, J. R. (2000). Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy white women. *Health Psychology*, *19*, 586–592.
- Akerlind, I., & Hörnquist, J. O. (1992). Loneliness and alcohol abuse: A review of evidences of an interplay. *Social Science & Medicine*, *34*, 405–414. doi:10.1016/0277-9536(92)90300-F
- Andersson, L. (1998). Loneliness research and interventions: A review of the literature. *Aging & Mental Health*, *2*, 264–274.
- Asparouhov, T., & Muthén, B. (2010). Multiple imputation with Mplus. Mplus technical report version 2. Retrieved from <http://www.statmodel.com/download/Imputations7.pdf>
- Ayalon, L. (2009a). Family and family-like interactions in households with round-the-clock paid foreign carers in Israel. *Ageing and Society*, *29*, 671–686.
- Ayalon, L. (2009b). Fears come true: The experiences of older care recipients and their family members of live-in foreign home care workers. *International Psychogeriatrics*, *21*, 779–786. doi:10.1017/s1041610209990421
- Ayalon, L. (2011a). Abuse is in the eyes of the beholder: Using multiple perspectives to evaluate elder mistreatment under round-the-clock foreign home carers in Israel. *Ageing & Society*, *31*, 499–520. doi:10.1017/s0144686x1000108x
- Ayalon, L. (2011b). Examining satisfaction with live-in foreign home care in Israel from the perspectives of care recipients, their family members, and their foreign home care workers. *Aging & Mental Health*, *15*, 376–384. doi:10.1080/1360786.3.2010.519323
- Ayalon, L., Green, O., Eliav, T., Asiskovich, S., & Shmelzer, M. (2013). Home care services to older adults: A report. Jerusalem, Israel: National Insurance Institute of Israel.
- Ayalon, L., Halevy-Levin, S., Ben-Yizhak, Z., & Friedman, G. (2013). Family caregiving at the intersection of private care by migrant home care workers and public care by nursing staff. *International Psychogeriatrics*, *25*, 1463–1473. doi:10.1017/S1041610213000628

- Ayalon, L., Kaniel, M., & Rosenberg, L. (2008). Social workers' perspectives on care arrangements between vulnerable elders and foreign home care workers: Lessons from Israeli/Filipino caregiving arrangements. *Home Health Care Services Quarterly*, 27, 121–142. doi:10.1080/01621420802022563
- Ayalon, L., & Shiovitz-Ezra, S. (2009). The experience of loneliness among live-in Filipino homecare workers in Israel: Implications for social workers. *British Journal of Social Work*, 40, 2538–2559. doi:10.1093/bjsw/bcq050
- Ayalon, L., & Shiovitz-Ezra, S. (2011). The relationship between loneliness and passive death wishes in the second half of life. *International Psychogeriatrics*, 23, 1677–1685. doi:10.1017/S1041610211001384
- Ayalon, L., Shiovitz-Ezra, S., & Palgi, Y. (2012). No place like home? Potential pathways to loneliness in older adults under the care of a live-in foreign home care worker. *The Journal of Psychology*, 146, 189–200. doi:10.1080/00223980.2011.574169
- Ayalon, L., Shiovitz-Ezra, S., & Palgi, Y. (2013). Associations of loneliness in older married men and women. *Aging & Mental Health*, 17, 33–39. doi:10.1080/13607863.2012.702725
- Beeson, R. A. (2003). Loneliness and depression in spousal caregivers of those with Alzheimer's disease versus non-caregiving spouses. *Archives of Psychiatric Nursing*, 17, 135–143.
- Beeson, R., Horton-Deutsch, S., Farran, C., & Neundorfer, M. (2000). Loneliness and depression in caregivers of persons with Alzheimer's disease or related disorders. *Issues in Mental Health Nursing*, 21, 779–806. doi:10.1080/016128400750044279
- Blozis, S. A., Ge, X., Xu, S., Natsuaki, M. N., Shaw, D. S., Neiderhiser, J. M., ...Reiss, D. (2013). Sensitivity analysis of multiple informant models when data are not missing at random. *Structural Equation Modeling: A Multidisciplinary Journal*, 20, 283–298. doi:10.1080/10705511.2013.769393
- Brodsky, G., Snoor, Y., & Beer, S. (2011). *Elderly in Israel: Facts and figures* [in Hebrew]. Jerusalem, Israel: Eshel.
- Cacioppo, J. T., Fowler, J. H., & Christakis, N. A. (2009). Alone in the crowd: The structure and spread of loneliness in a large social network. *Journal of Personality and Social Psychology*, 97, 977–991. doi:10.1037/a0016076
- Cacioppo, J. T., Hughes, M. E., Waite, L. J., Hawkley, L. C., & Thisted, R. A. (2006). Loneliness as a specific risk factor for depressive symptoms: Cross-sectional and longitudinal analyses. *Psychology and Aging*, 21, 140–151. doi:2006-03906-014 [pii]10.1037/0882-7974.21.1.140
- Cohen, M., Levin, S. H., Gagin, R., & Friedman, G. (2007). Elder abuse: Disparities between older people's disclosure of abuse, evident signs of abuse, and high risk of abuse. *Journal of the American Geriatrics Society*, 55, 1224–1230. doi:10.1111/j.1532-5415.2007.01269.x
- de Jong-Gierveld, J., & Kamphuis, F. (1985). The development of a Rasch-Type loneliness scale. *Applied Psychological Measurement*, 9, 289–299. doi:10.1177/014662168500900307
- Dong, X., Simon, M. A., Gorbien, M., Percak, J., & Golden, R. (2007). Loneliness in older Chinese adults: A risk factor for elder mistreatment. *Journal of the American Geriatrics Society*, 55, 1831–1835. doi:10.1111/j.1532-5415.2007.01429.x
- Eisikovits, Z., Winterstein, T., & Lowenstein, A. (2004). *A survey of abuse and neglect of older adults in Israel* [in Hebrew]. Haifa, Israel: The University of Haifa.
- Ekwall, A. K., Sivberg, B., & Hallberg, I. R. (2005). Loneliness as a predictor of quality of life among older caregivers. *Journal of Advanced Nursing*, 49, 23–32. doi:10.1111/j.1365-2648.2004.03260.x
- Hackett, R. A., Hamer, M., Endrighi, R., Brydon, L., & Steptoe, A. (2012). Loneliness and stress-related inflammatory and neuroendocrine responses in older men and women. *Psychoneuroendocrinology*, 37, 1801–1809. doi:10.1016/j.psyneuen.2012.03.016
- Hawkley, L. C., Hughes, M. E., Waite, L. J., Masi, C. M., Thisted, R. A., & Cacioppo, J. T. (2008). From social structural factors to perceptions of relationship quality and loneliness: The Chicago health, aging, and social relations study. *Journal of Gerontology. Series B, Psychological Sciences and Social Sciences*, 63, S375–S384.
- Heller, E. (2003). *The treatment of older adults in Israel. The topic of foreign home care workers in Israel and Israeli nursing care workers- Needs and available solutions* [in Hebrew]. Jerusalem, Israel: Haknesset: Research and Information Center.
- Heun, R., Bonsignore, M., Barkow, K., & Jessen, F. (2001). Validity of the five-item WHO Well-Being Index (WHO-5) in an elderly population. *European Archives of Psychiatry and Clinical Neuroscience*, 251, 27–31. doi:10.1007/bf03035123
- Hughes, M. E., Waite, L. J., Hawkley, L. C., & Cacioppo, J. T. (2004). A short scale for measuring loneliness in large surveys: Results from two population-based studies. *Research on Aging*, 26, 655–672. doi:10.1177/0164027504268574
- Iecovich, E. (2007). Client satisfaction with live-in and live-out home care workers in Israel. *Journal of Aging & Social Policy*, 19, 105–122. doi:10.1300/J031v19n04_06
- Iecovich, E., & Doron, I. (2012). Migrant workers in eldercare in Israel: Social and legal aspects. *European Journal of Social Work*, 15, 29–44. doi:10.1080/13691457.2011.562066
- Katz, S., Downs, T. D., Cash, H. R., & Grotz, R. C. (1970). Progress in development of the index of ADL. *The Gerontologist*, 10, 20–30. doi:10.1093/geront/10.1_Part_1.20
- Kenny, D. A., & Judd, C. M. (1986). Consequences of violating the independence assumption in analysis of variance. *Psychological Bulletin*, 99, 422–431. doi:10.1037/0033-2909.99.3.422
- Kenny, D. A., Kashy, D. A., & Cook, W. L. (2006). *Dyadic data analysis*. New York: Guilford.
- Kenny, D. A., Mannetti, L., Pierro, A., Livi, S., & Kashy, D. A. (2002). The statistical analysis of data from small groups. *Journal of Personality and Social Psychology*, 83, 126–137.
- Kurina, L. M., Knutson, K. L., Hawkley, L. C., Cacioppo, J. T., Lauderdale, D. S., & Ober, C. (2011). Loneliness is associated with sleep fragmentation in a communal society. *Sleep*, 34, 1519–1526.
- Lauder, W., Mummery, K., Jones, M., & Caperchione, C. (2006). A comparison of health behaviours in lonely and non-lonely populations. *Psychology, Health & Medicine*, 11, 233–245. doi:10.1080/13548500500266607
- Lawton, M. P., & Brody, E. M. (1969). Assessment of older people: Self-maintaining and instrumental activities of daily living. *The Gerontologist*, 9, 179–186. doi:10.1093/geront/9.3_Part_1.179
- Ledermann, T., & Kenny, D. A. (2012). The common fate model for dyadic data: Variations of a theoretically important but underutilized model. *Journal of Family Psychology*, 26, 140–148. doi:10.1037/a0026624
- Lo, Y., Mendell, N. R., & Rubin, D. B. (2001). Testing the number of components in a normal mixture. *Biometrika*, 88, 767–778. doi:10.1093/biomet/88.3.767

- Lowenstein, A., Eisikovits, Z., Band-Winterstein, T., & Enosh, G. (2009). Is elder abuse and neglect a social phenomenon? Data from the First National Prevalence Survey in Israel. *Journal of Elder Abuse & Neglect*, *21*, 253–277. doi:10.1080/08946560902997629
- Lubke, G. H., & Muthén, B. (2005). Investigating population heterogeneity with factor mixture models. *Psychological Methods*, *10*, 21–39. doi:2005-03264-002 [pii]10.1037/1082-989X.10.1.21
- Lubke, G., & Neale, M. (2008). Distinguishing between latent classes and continuous factors with categorical outcomes: Class invariance of parameters of factor mixture models. *Multivariate Behavioral Research*, *43*, 592–620. doi:10.1080/00273170802490673
- MacRae, H. (1999). Managing courtesy stigma: The case of Alzheimer's disease. *Sociology of Health & Illness*, *21*, 54–70. doi:10.1111/1467-9566.t01-1-00142
- Marangoni, C., & Ickes, W. (1989). Loneliness: A theoretical review with implications for measurement. *Journal of Social and Personal Relationships*, *6*, 93–128. doi:10.1177/026540758900600107
- Martin-Matthews, A. (2007). Situating 'home' at the nexus of the public and private spheres: Ageing, gender and home support work in Canada. *Current Sociology*, *55*, 229–249. doi:10.1177/0011392107073305
- McCutcheon, A. L. (2002). Basic concepts and procedures in single and multiple group latent class analysis. In J. A. Hagenaars & A. L. McCutcheon (Eds.), *Applied latent class analysis* (pp. 56–87). Cambridge, UK: Cambridge University Press.
- Muthén, L. K., & Muthén, B. O. (1998–2011). *Mplus User's Guide* (6th ed.). Los Angeles, CA: Muthén & Muthén.
- National Insurance Institute of Israel. (2011). *Annual review: Long term care community law* [in Hebrew]. Jerusalem, Israel: Author.
- Ong, A. D., Rothstein, J. D., & Uchino, B. N. (2012). Loneliness accentuates age differences in cardiovascular responses to social evaluative threat. *Psychology and Aging*, *27*, 190–198. doi:10.1037/a0025570
- Patterson, A. C., & Veenstra, G. (2010). Loneliness and risk of mortality: A longitudinal investigation in Alameda County, California. *Social Science & Medicine*, *71*, 181–186. doi:10.1016/j.socscimed.2010.03.024
- Pinquart, M. (2003). Loneliness in married, widowed, divorced, and never-married older adults. *Journal of Social and Personal Relationships*, *20*, 31–53. doi:10.1177/02654075030201002
- Russell, D., Peplau, L. A., & Cutrona, C. E. (1980). The revised UCLA Loneliness Scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology*, *39*, 472–480. doi:10.1037/0022-3514.39.3.472
- Schachter, E. P., & Zlotogorski, Z. (1995). Self-critical and dependent aspects of loneliness. *The Israel Journal of Psychiatry and Related Sciences*, *32*, 205–211.
- Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods*, *7*, 147–177. doi:10.1037/1082-989X.7.2.147
- Sered, S. S. (1990). Women, religion, and modernization: Tradition and transformation among elderly Jews in Israel. *American Anthropologist*, *92*, 306–318. doi:10.1525/aa.1990.92.2.02a00030
- Shankar, A., McMunn, A., Banks, J., & Steptoe, A. (2011). Loneliness, social isolation, and behavioral and biological health indicators in older adults. *Health Psychology*, *30*, 377–385. doi:10.1037/a0022826
- Shiovitz-Ezra, S., & Ayalon, L. (2010). Situational versus chronic loneliness as risk factors for all-cause mortality. *International Psychogeriatrics*, *22*, 455–462. doi:10.1017/S1041610209991426
- Singh-Manoux, A., Marmot, M. G., & Adler, N. E. (2005). Does subjective social status predict health and change in health status better than objective status? *Psychosomatic Medicine*, *67*, 855–861. doi:10.1097/01.psy.0000188434.52941.a0
- Smith, J., Fisher, G., Ryan, L., Clarke, P., House, J., & Weir, D. (2013). *Psychosocial and lifestyle questionnaire: 2006–2010. Documentation report core section LB*. Ann Arbor, MI: Michigan Survey Research Center Institute for Social Research University of Michigan. Retrieved from <http://hrsonline.isr.umich.edu/sitedocs/userg/HRS2006-2010SAQdoc.pdf>
- Sorkin, D., Rook, K. S., & Lu, J. L. (2002). Loneliness, lack of emotional support, lack of companionship, and the likelihood of having a heart condition in an elderly sample. *Annals of Behavioral Medicine*, *24*, 290–298. doi:10.1207/s15324796abm2404_05
- StataCorp. (2009). *Stata statistical software: Release 11*. College Station, TX: StataCorp LP.
- Stravynski, A., & Boyer, R. (2001). Loneliness in relation to suicide ideation and parasuicide: A population-wide study. *Suicide & Life-threatening Behavior*, *31*, 32–40. doi:10.1521/suli.31.1.32.21312
- Vermunt, J. K., & Magidson, J. (2002). Latent class cluster analysis. In J. A. Hagenaars & A. L. McCutcheon (Eds.), *Applied latent class analysis* (pp. 89–106). New York: Cambridge University Press.
- Werner, P., & Heinik, J. (2008). Stigma by association and Alzheimer's disease. *Aging & Mental Health*, *12*, 92–99. doi:10.1080/13607860701616325
- West, D. A., Kellner, R., & Moore-West, M. (1986). The effects of loneliness: A review of the literature. *Comprehensive Psychiatry*, *27*, 351–363. doi:10.1016/0010-440X(86)90011-8
- Whisman, M. A. (2010). Loneliness and the metabolic syndrome in a population-based sample of middle-aged and older adults. *Health Psychology*, *29*, 550–554. doi:10.1037/a0020760
- Wilson, R. S., Krueger, K. R., Arnold, S. E., Schneider, J. A., Kelly, J. F., Barnes, L. L., ...Bennett, D. A. (2007). Loneliness and risk of Alzheimer disease. *Archives of General Psychiatry*, *64*, 234–240. doi:10.1001/archpsyc.64.2.234