



Social network type in the continuing care retirement community

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ABSTRACT

The present study evaluated a social network typology of continuing care retirement community (CCRC) residents and examined it against their physical and emotional wellbeing. The social network typology was constructed, using a name-generator, followed by detailed questions about the characteristics of the individuals who make up the network and the nature of the relationship with them. Latent profile analysis was used to develop a typology of the social network in the CCRC. A two-profile solution had the best fit to the data (Entropy = .955, BIC = 3178.397). This solution consisted of a friends-based network ($N = 97$), and a child-based network ($N = 108$). The two networks differed on most constituent variables used for the creation of the two profiles (e.g., overall network size, proportion of friends, family members and spouse in the network). The two profiles did not differ in terms of the number of medical conditions, impairment in activities of daily living, wellbeing, and loneliness. Possibly, compared with the community, network type plays a lesser role in the CCRC because of its social characteristics and attempt to meet older adults' social needs.

1. Introduction

A growing number of studies in the field of gerontology has examined older adults' social network typology (Fiori, Antonucci, & Akiyama, 2008; Li & Zhang, 2015; Litwin & Shiovitz-Ezra, 2011). This profound body of literature has generally divided the social network of older adults according to its composition, identifying four or five different types of networks: diverse, friend, family, congregate, restricted (Litwin & Shiovitz-Ezra, 2011; Litwin, 2001). A socially restricted network usually fairs worse than all other networks, whereas a diverse-network, composed of friends and family members as well as networks, which are based solely on friends have resulted in the best health and mental health outcomes. This typology of the social network has varied somewhat across different cultures and countries (Fiori et al., 2008; Litwin, 2001). Nevertheless, its association with a variety of outcomes, including mortality, morale, anxiety, depression, and health behaviors has remained largely persistent (García, Banegas, Pérez-Regadera, Cabrera, & Rodríguez-Artalejo, 2005; Park, Smith, & Dunkle, 2014).

1.1. Social networks in the continuing care retirement community

Although the current body of literature on social networks is impressive in its depth and breadth, we know little about older adults' social networks in continuing care retirement communities (CCRCs) (Schafer, 2011; Stacey-Konnert & Pynoos, 1992). CCRCs represent a residential alternative available to more affluent older adults who are

independent in their activities of daily living at least when first entering the premise (Ayalon, 2015). In Israel, CCRCs are privately funded. Compared with other residential settings, the CCRC provides high levels of autonomy to older adults, at least upon first entering as independent residents. Research has shown, however, that once older adults become increasingly disabled, they tend to lose their autonomy and often are transferred to higher levels of care, which are disconnected from the independent living unit. Currently, only about 3% of all older adults in Israel live in institutional care (e.g., nursing homes, assisted living facilities, CCRCs). As of 2013, there were about 11,000 privately funded residential units in the country (Brodsky, Shnoor, & Be'er, 2017).

In contrast to older adults in the community, CCRC residents live in an age-segregated community (Dobbs et al., 2008; Hrybyk et al., 2012). In such a community, interactions with other residents are supposedly more accessible than interactions with people outside the CCRC (Stacey-Konnert & Pynoos, 1992). Indeed, a major pull factor, responsible for attracting older adults to the CCRC is the opportunity to engage in various formal and informal social interactions (Bekhet, Zauszniewski, & Nakhla, 2009; Krout, Moen, Holmes, Oggins, & Bowen, 2002). Older adults in CCRCs can attend a variety of sports and recreational courses. They also have opportunities for informal interactions in common areas of the CCRCs, such as the lobby area (Ayalon & Green, 2013; Perkinson & Rockemann, 1996). In support of the notion of the CCRC as a social outlet for older adults, research has found that older adults in CCRCs, often report improved social relations and decreased loneliness compared with community dwelling older adults

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(Heisler, Evans, & Moen, 2003).

A major push factor for older adults who consider moving into a CCRC is the wish not to burden their children, as many older adults first join a CCRC upon noticing the first sign of decline. The realization that more assistance might be needed soon, motivates some older adults to seek out formal services in the form of relocating into a CCRC (Bekhet et al., 2009; Krout et al., 2002). As a result of the strong emphasis put on social relations in the CCRC, it is possible that family members capture a smaller role in the lives of CCRC residents, whereas friends in the CCRC might capture a more substantial role (Street, Burge, Quadagno, & Barrett, 2007). Yet, others have found that relationships with friends from outside the setting were associated with lower levels of depression (Potts, 1997).

A qualitative study conducted in the CCRC has shown that indeed, social networks in the CCRC can be examined through a somewhat different lens, compared with social networks of older adults in the community (Ayalon & Green, 2013). That study proposed that CCRC residents use space and time when classifying their social networks. Residents classified relationships as closer and more meaningful if they were not confined to the CCRC or occurred within their private apartment in the CCRC, rather than in the lobby or in other public areas. A different classification distinguished between relationships which were established a long time ago, even prior to entering the CCRC, and those relationships that were developed only after entering the CCRC.

To date, research on social network in CCRC residents (Ayalon & Green, 2013; Schafer, 2016; Stacey-Konnert & Pynoos, 1992), has not attempted to construct a typology of social networks, which could potentially encompass both CCRC residents, friends and family members. This is despite the fact that one of the “pull” factors for older adults who transition to a CCRC is the opportunity to interact with friends, whereas a major “push” factor is the limited social interactions in one’s original community of residence (Bekhet et al., 2009; Krout et al., 2002).

The CCRC represents a well-defined community, with clear physical and social boundaries (Ayalon, Yahav, & Lesser, 2018). These boundaries separate young from old and oftentimes, old from old who present with visible signs of disability, as both age and physical functioning represent eligibility criteria for entering a CCRC (Ayalon, 2015; Shippee, 2009). Thus, the independent unit of the CCRC likely represents a community of older adults of more homogenous characteristics compared with older adults who live in the community. The fact that the CCRC is privately funded and is available only to well-off older adults further differentiates CCRC residents from community dwellers. These unique characteristics of the CCRC justify the examination of CCRC residents as a unique group that potentially has different network characteristics from community dwelling older adults.

In light of the profound body of literature on the importance of the social network to the health and wellbeing of older adults (García et al., 2005; Li & Zhang, 2015; Litwin & Shiovitz-Ezra, 2011; Park et al., 2014) and the fact that CCRCs likely represent a very different social setting compared with the community (Campbell, 2015; Schafer, 2011; Stacey-Konnert & Pynoos, 1992), this study aimed to develop a typology of social networks among CCRC residents and to examine the typology against a variety of physical and emotional wellbeing indicators, which have shown to be associated with the network typology among community dwelling older adults (Cheng, Lee, Chan, Leung, & Lee, 2009; Fiori, Antonucci, & Cortina, 2006; Litwin & Shiovitz-Ezra, 2011). In the absence of prior research on social network type in CCRC residents, no clear hypotheses were specified. However, a potential comparison of a friends- vs. child-based network appeared particularly relevant, in light of the fact that the study was conducted in Israel, a country that vacillates between traditional family values and more modern values of independence (Lavee & Katz, 2003). In such a society, one would expect family relations to be stronger among the older generations, but the younger generations might be prone to developing relationships with friends rather than family.

2. Methods

The present study was funded by the Israel Science Foundation (537/16) to examine social networks among older adults. Four CCRCs were selected to represent settings of different size and geographic location. The smallest setting had 40 residents, whereas the largest setting had 299 residents. Two of the settings were located in the center of the country and two were located in Jerusalem. Because the overall goal of the original study was to assess social networks, all residents in each of the four CCRCs were invited to participate in the study. Exclusion criteria were dementia or severe physical illness as indicated by the CCRC social worker. In addition, older adults who did not speak Hebrew or English also were excluded from the study. We also excluded those who left the setting during the data collection period and those who did not reside in the independent living section of the CCRC. Non-participation rate ranged between 29% and 41%, across settings ($N = 369$). However, of this total, a substantial number of older adults ($N = 208$) was not interviewed due to not meeting the inclusion criteria (e.g., dementia, severe illness etc.).

A total of 229 residents participated in the study. The average age of participants was 85.4($SD = 6.7$), the majority were non-married 205(89.5%) and women 182, 79.5%). The average level of education of participants was 12.4($SD = 4.0$). See Table 1 for sample characteristics.

2.1. Measures

Data were collected through face-to-face interviews conducted by trained research assistants. Interviews were conducted in English or in Hebrew. Each interview lasted about one and a half hours. All interviews were uploaded directly to the computer-assisted system.

2.1.1. Social network indicators

We used a name generator to obtain a list of all potentially meaningful individuals to the respondent: “From time to time, people discuss with others about things that matter to them. Whom can you share good news, bad news, concerns you may have, or speak about things which are very important to you?” The name list generated by the respondent was followed by a detailed set of questions about the relationship to the respondent of each of the individuals named by the respondent and the nature of the relationship (e.g., frequency of contact, revealing secrets). We used the following items to construct the typology: Overall network size (number of individuals listed by the respondents), the proportion of friends in the network, the proportion of family members in the network (consisting mainly of adult children), the proportion of spouse out of all relationships in the network, the average frequency with network members (1 = never, 7 = on a daily basis), the average level of sharing secrets with network members (0 = not at all, 4 = a lot).

Table 1
Sample characteristics ($N = 229$).

Sample characteristics	Mean (SD)/N(%)
<i>Demographic characteristics</i>	
Age in years	85.4(6.7)
Women	182(79.5%)
Years of education	12.7(4.0)
Married	24(10.5%)
Number of years in the CCRC	6.02(6.11)
<i>Physical and emotional wellbeing</i>	
Number of medical conditions	1.36(1.17)
Impairment in activities of daily living	.85(1.81)
Wellbeing	3.30(1.21)
Loneliness	1.45(.58)

2.2. Sociodemographic variables

Respondents provided their age in years, number of years of education, marital status (married/partnered = 1 vs. widowed, separated, never married = 0), and number of years in the CCRC.

2.3. Physical and emotional wellbeing

2.3.1. Physical health

Physical health was assessed by the number of chronic conditions reported by the respondent (e.g., diabetes, hypertension, heart condition, stroke, arthritis; range 0–8). A higher score indicates more physical conditions.

2.3.2. Overall functioning

Overall functioning was assessed using an Activities of Daily Living (ADL) scale (e.g., requires assistance in showering, dressing up, transfer, range 0–6), which followed a yes/no response format (Lawton & Brody, 1969). A higher score indicates greater impairment.

2.3.3. Emotional wellbeing

Emotional wellbeing was evaluated using the WHO-5 Wellbeing index, which is a five-item scale (Heun, Bonsignore, Barkow, & Jessen, 2001), which assesses positive mood, vitality and interest over a two-week period. Sample questions include the following: “I woke up feeling fresh and rested,” “I have felt calm and relaxed”. Scale ranges between not at all-0 and all the time-5. A mean score was calculated, with a higher overall score representing greater wellbeing ($\alpha = .88$).

2.3.4. Loneliness

Loneliness was assessed using one of the most widely used scales of loneliness: the short R-UCLA Scale (Hughes, Waite, Hawkey, & Cacioppo, 2004; Russell, Peplau, & Cutrona, 1980). The measure includes three questions (e.g., “How often do you feel you lack companionship?” “How often do you feel isolated from others?”), rated on a three-point scale (recoded: 1 = hardly ever or never; 3 = often). A mean score was calculated, with a higher overall score representing greater loneliness (range 1–3) ($\alpha = .83$).

2.4. Analysis

Data were analyzed using R (R Development Core Team, 2011). I first obtained descriptive data. Next, I calculated a social network typology, using latent profile analysis. The purpose of latent analysis is to decompose individuals into groups in order to present a theoretical concept or phenomenon which cannot be directly observed in the data. The basis for group membership is inferred from the data and is not known a-priori. The method detects profiles of respondents 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 & Muthen, 2005). In the present study, six continuous variables were entered as potential indicators: network size, proportion of friends in the network, proportion of family members in the network, proportion of relationship with spouse out of network size, average frequency of contact with network members, and average level of revealing secrets to network members.

The overall goal is to achieve an adequate model fit with the lowest number of profiles, as this represents the most parsimonious solution. An additional profile is deemed plausible only if it adds useful information regarding the heterogeneity of the population (Lubke & Muthen, 2005). In the present study, we started with a single-profile solution and increased the number of profiles until no further improvement in model fit was achieved. The Bayesian information criteria (BIC) was used as an indicator of model fit. A lower BIC is indicative of better fit. In addition, entropy provides information on how well the

model predicts profile membership. The closer the entropy score is to 1, the better the prediction is. After determining the profile-solution, latent profile membership was used as a between-subject variable for bivariate analyses to examine differences in physical and emotional wellbeing.

3. Results

3.1. A social network typology

Latent profile analysis was conducted with six indicators. A single profile-solution resulted in a BIC of 3197.916 and an Entropy score of 1. A two-profile solution resulted in a BIC of 3178.397 and an Entropy score of .955. A three-profile solution resulted in a BIC of 3024.857 and an Entropy score of .961. Although this model resulted in an improved fit, it had one very small profile ($N = 4$) of individuals high in the proportion that their relationship with their spouse captured in the overall network and low in the proportion that relationship with family members or friends captured in the overall network. A four-profile solution resulted in a poorer fit: An Entropy score of .958, though the BIC was 2950.589. It also contained a very small profile ($N = 4$). Hence, a two-profile solution of friends- vs. adult-child- based typology was deemed as the most appropriate.

Table 2 outlines the profile indicators and their distribution across the two profiles. There were significant differences across the two profiles on four of the six indicators: Overall network size, proportion of friends in the network, proportion of family members in the network (primarily adult children), proportion of relationship with spouse out of the entire network. Two of the six social network indicators: Likelihood of revealing secrets to network members and frequency of contact, did not distinguish between the two profiles. Based on the identified differences, the profiles can be characterized as friends-based and adult child-based profiles, as described below. See Fig. 1¹ for details.

A friends-based profile ($N = 97$) is characterized by a high network size and a high proportion of friends in the network. It also has a high proportion of spouse in the network. It has a low proportion of family members in the network.

A child-based profile ($N = 108$) is characterized by a low network size, a high proportion of family members in the network (mainly adult children), and a low proportion of friends and spouse in the network (as residents classified into this profile were less likely to identify their friends or their spouse as significant others).

3.2. Bivariate differences by network typology

Respondents classified into a friends-based network were significantly younger than respondents classified into a child-based network. There were no other differences across the two profiles, who were similar in terms of demographic characteristics and physical and emotional wellbeing. See Table 3 for details.

4. Discussion

This is the first study to develop a social network typology among CCRC residents. Past research has shown that older CCRC residents evaluate social ties, using somewhat different criteria from the ones commonly used in the field of gerontology (Ayalon & Green, 2013). Given the fact that CCRC residents live in a relatively age-, socio-economic- and even functional- homogenous community, which is specifically designed to meet their social needs (Campbell, 2015), it is important to evaluate the unique network characteristics of CCRC residents and identify their associations with physical and mental wellbeing.

¹ Standardized indicators are presented.

Table 2
Network profiles and their indicators.

	Total sample ^a (229)	Friends-based (97)	Child-based(108)	t(df), p/ χ^2 (df), p
<i>Network typology indicators</i>				
Overall network size	3.78(2.40)	4.67(2.90)	2.98(1.37)	5.24(133.37), p < .001
Proportion of friends in the network	.27(.35)	.5(.36)	.06(.13)	11.46(118.47), p < .001
Proportion of family members in the network	.63(.37)	.3(.25)	.92(.14)	−21.75(15.34), p < .001
Proportion of relationship with spouse out of the entire network	.03(.12)	.05(.17)	.01(.05)	2.17(110.44), p = .03
Frequency of contact (1-7)	4.53(1.16)	4.65(1.25)	4.43(1.07)	1.35(186.29), p = .18
Revealing secrets to network members (0-4)	3.91(.86)	3.83(.84)	3.98(.88)	−1.24(199.72), p = .21

^a Due to missing values on network indicators, the two profiles do not sum up to 229.

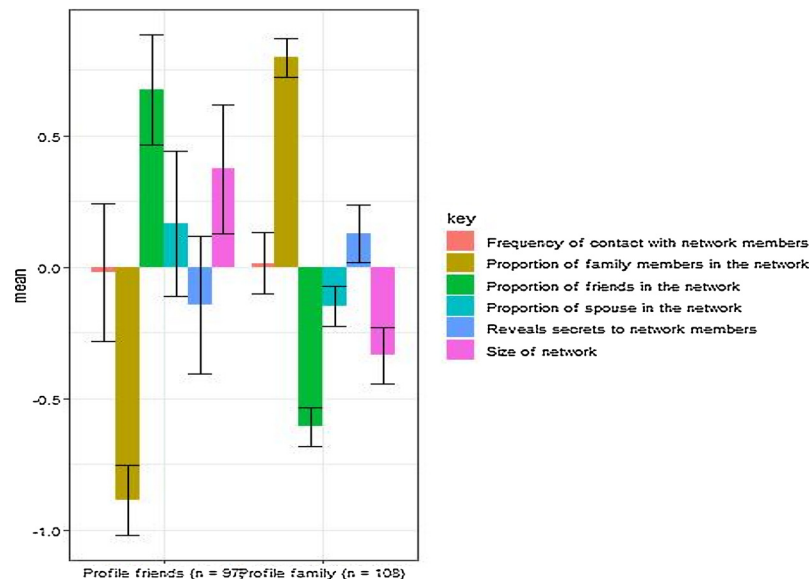


Fig. 1. Social network indicators by social network profile.

Table 3
Sample characteristics by network profile.

	Friends-based (97)	Child-based(108)	t(df), p/ χ^2 (df), p
<i>Demographic characteristics</i>			
Age in years	78.81(21.36)	84.14(15.86)	−1.99(174.04), p = .04
Women	79 (81%)	85(79%)	.09(1), p = .75
Years of education	13.31(3.85)	12.65(4.71)	1.08(190.82), p = .28
Married	8(9%)	9(8%)	.00(1), p = 1
Number of years in the CCRC	5.8(6.61)	6.22(5.66)	−.45(162.44), p = .65
<i>Physical and emotional wellbeing</i>			
Number of medical conditions	1.36(1.17)	1.37(1.17)	−.06(200.93), p = .95
Impairment in activities of daily living	.74(1.72)	.95(1.89)	−.84(202.98), p = .40
Wellbeing	3.34(1.17)	3.27(1.25)	.42(196.69), p = .68
Loneliness	1.48(.6)	1.42(.56)	.67(192.78), p = .51

Using latent profile analysis to classify respondents' social network, two unique profiles emerged. The sample was almost equally divided across the two profiles. One profile was composed of older adults who had a friends-based network and a second profile was composed of older adults who had a child-based network. The friends-based network was characterized by a high network size and a high proportion of friends in the network. It also had a high proportion of spouse in the network and a low proportion of family members (mainly adult children). The child-based network, on the other hand, was characterized by a low network size, a high proportion of family members (adult children) in the network, and a low proportion of friends and spouse in the network.

This division into two distinct profiles is quite different from past research, which has generally resulted in a four-five profile solution

(Cheng et al., 2009; Litwin & Shiovitz-Ezra, 2011; Shiovitz-Ezra & Litwin, 2015). Although both friends- and child-based profiles were identified in past research conducted in the community, other profiles, such as a restricted network, composed of limited friends and family members, a religious/traditional network or a mixed-network also were evident (Litwin, 2001).

There are several potential reasons for this discrepancy between the present findings and past research. First, this study examined social networks in CCRC residents, whereas past research has focused exclusively on the community (Cheng et al., 2009; Litwin & Shiovitz-Ezra, 2011; Shiovitz-Ezra & Litwin, 2015). Possibly, those individuals who are drawn to live in a CCRC are quite different from community dwelling older adults. We know from past research that social considerations play a major role in the decision to relocate into a CCRC

(Bekhet et al., 2009). A restricted- or a religious-based network found in past research (Litwin, 1998) might be less relevant in the CCRC, which promotes social contacts among its members and relies on social relationships as a major pull factor (Campbell, 2015).

Another possible reason for the present findings stems from the relatively small sample size. Although the present sample was sufficient in size for the type of analysis conducted (Gudicha, Tekle, & Vermunt, 2016), a three-profile solution resulted in a third profile which was too small to be meaningfully incorporated in the analysis. This third profile was characterized as a spouse-based network, which is low in contacts with family members and friends and thus, is quite similar to the restricted network described in past research (Litwin, 1998). Possibly, a larger sample would have made the addition of a third profile meaningful. It is important to note, however, that there is support for a similar two-profile solution also among community dwelling older adults in Ireland (Golden, Conroy, & Lawlor, 2009). Finally, an alternative explanation could be due to the fact that this study, in contrast to past research, did not explore the role of participation in community or religious organizations. Future research will benefit from exploring these activities as potential variables of importance in the network typology of CCRC residents.

The only difference found between the friends- and child-based network profiles was the age of the respondents who make up the profile. Individuals classified into the friends-based profile were significantly younger than those classified into the child-based profile. This finding is different from several other studies, which did not find significant age differences between these two profiles (Fiori et al., 2006; Litwin, 2001). Possibly, the fact that this study was conducted in a CCRC can explain this finding.

Past research has shown that individuals in the CCRC are quite concerned about associating with other older adults and actively attempt to disassociate from having an old person image (Ayalon, 2015). The CCRC is presented as an opportunity to celebrate old age and to maintain a youthful appearance (Gamliel & Hazan, 2006). Possibly, as people age, their social opportunities in the CCRC become more limited because of the tendency of the CCRC and its residents to emphasize a youthful appearance. As a result, older adults might resort to contact with family members. Alternatively, as has been shown in past research and in accordance with the socioemotional selectivity theory (Carstensen, 1992), it is possible that as people age and their sense of time in this world becomes more limited, they tend to seek out more intimate relationship and to refrain from superficial ones. The tendency to seek out family relations in old age (Golden et al., 2009) could also be explained by the fact that older Israelis likely represent a more traditional view which favors family relations, whereas younger CCRC residents in Israel possibly represent more modern views of social interaction, which give more room to relationship with friends (Lavee & Katz, 2003).

An unexpected finding is that the two profiles were indistinguishable in terms of their physical and mental wellbeing. Possibly, the CCRC provides a supportive environment which makes the type of social network less relevant. This explanation is potentially supported by the fact that the two profiles were similar in the frequency of contact with social network members and in the revelation of personal secrets to other network members. Hence, although the network composition of the two profiles was different, other network characteristics did not differ between the two profiles nor did the physical and mental wellbeing of respondents. An alternative explanation for the discordance between this study and past research could be the tendency of social science to over emphasize significant findings and disregard null results (Peplow, 2014). Hence, it is quite possible that non-significant results concerning the association of social network type and wellbeing indicators are not published.

Despite its strengths, in reviewing these findings, it is important to note some of the study's limitations. First, this is a non-representative sample, which cannot be generalized to the entire population of CCRC

users. In addition, although the size of the sample was adequate for the type of analysis conducted (Gudicha et al., 2016), a three-profile solution deemed inadequate given the small size of the third profile. Moreover, we did not differentiate between never married, divorced and widowed due to the relatively limited sample size. This is unfortunate, given past research which has shown a relationship between these varied marital statuses and loneliness (Pinquart, 2003). Finally, the reliance on a cross-sectional design impaired our ability to develop a temporal explanatory model. Nevertheless, these findings are important because they demonstrate that two distinct profiles of older CCRC residents exist. One profile is characterized by reliance on friends as the main network figures, whereas the second profile is characterized by family members (primarily adult children) as the main network figures. Although the two profiles do not differ in terms of physical and mental wellbeing, this division is important because it points to the diversity among CCRC residents. Moreover, it potentially suggests that despite differences in social network type, CCRC residents are more similar than different. This similarity could potentially be explained by the fact that the CCRC provides a comprehensive social outlet for older adults and thus, meets older adults' needs regardless of their network type. Further research on older CCRC residents' social networks is desired to better understand the unique network characteristics of this population (Ayalon & Green, 2013).

Declaration of Competing Interest

There is no conflict of interest to report

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