Grandpal Penpals: A qualitative study of a social program on senior quality of life in residential care facilities

Yuqing Ding[1], Bonnie Cheung[1], Timothy Kong[1], Wan-Yi Lee[1], Jennifer Yao[1]
Citation: UBCMJ. 2017: 8.2 (16-20)

Abstract

Objectives Grandpal Penpals (GP) is a unique community program that connects seniors living in residential care with elementary school students through pen pal letter writing and visits. A common belief is that seniors have a lower quality of life in residential care facilities. We qualitatively explored how this program related to the senior participants' quality of life in the domains of motivation, activities, relationships, and autonomy.

Methods Among participants in the GP program, seniors who were sufficiently cognitively intact were chosen to participate in our study. In–person interviews were conducted with participants at the beginning and at the end of the program to determine major themes.

Results Four major themes were identified: 1) GP strengthened the participants' pre–existing motivations, 2) participants perceived social programs like GP to be enjoyable and beneficial while actively involved, 3) most participants found that GP did not affect their interpersonal relationships, and 4) GP did not affect the participants' self–perceived level of autonomy.

Conclusions While participants greatly enjoyed GP, they perceived little relation of the program to their overall quality of life. Our research suggests that other highly engaging, goal–oriented, long–term social programs with increased senior–senior or senior–family interaction may be of greater relevance and benefit.

Abbreviations GP, Grandpal Penpals; QoL, Quality of Life; ADLs, activities of daily living; P#, participant identification number (randomly assigned to maintain participant anonymity)

Introduction

By 2036, approximately 25% of the Canadian population will be over 65 years old.[1] With increased age and chronic illness, the capacity to carry out activities of daily living (ADLs) is compromised due to deterioration of overall health.[2,3] In 2014, almost 33% of Canadian seniors were living in full service residential care facilities[1]—facilities which care for seniors unable to independently perform ADLs.

Quality of life (QoL) in residential care facilities is an active area of research with literature showing that increased QoL can improve survival and decrease morbidity.[4] As defined by the WHO, QoL is an individual's perception of life in relation to their goals, expectations, standards, and concerns.[5] These positive domains are common focuses for public health promotion programs,[6] and may include: empowerment to live, functional competence, social relationships, meaningful activities outside ADLs, and global motivation.[6,7]

Grandpal Penpals (GP) is a novel 8–month community program that connects seniors living in residential care facilities with elementary school students through monthly letter writing and social visits. Recreational staff at the residential facilities help senior participants read and respond to letters. Social visits, organized around themes of "family", "fitness", and "music", take place at either the residential facilities or elementary schools, and involve activities such as games, crafts, and singing. For four years, GP has been established in multiple Vancouver–based residential care facilities and elementary schools. Though it has been verbally received well by past participants, its relation to participants' QoL has yet to be evaluated.

Throughout the 2015-2016 program, senior participants were individually interviewed to discuss their QoL in context of four relevant domains: autonomy, meaningful activities, relationships, and motivation. This article shares recurrent themes regarding this program's relation to QoL in residential care facilities.

Materials and Methods

Ethics approval

Ethics approval for this project was obtained from the University of British Columbia Behavioural Research Ethics Board (H15-02255). All participants provided informed verbal consent, with witness signatures by residential facility staff. No participants received any reward for involvement or penalty for withdrawing.

We hereby declare that for research involving human subjects, procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000.

Recruitment of participants

English speaking seniors residing in Arbutus Care Centre and Point Grey Private Hospital who agreed to participate in GP were eligible. Care facility recreational staff identified potentially eligible individuals who met inclusion criteria. Seniors who were not deemed competent to provide informed consent were excluded, such as those with severe dementia who were unable to understand the purpose, operation, benefits, and risks of the program. The participants' cognitive statuses were not formally assessed, as no clear Mini-Mental State Exam or Montreal Cognitive Assessment Tool score would be representative of the participants' abilities to partake in the program and comment on their experience.

Interview question design

With numerous measurement tools, QoL research has not always been consistent. Furthermore, no validated qualitative instruments exist. Definitions and terminology from various studies[6,7] were used to design open–ended questions to address the four most pertinent QoL domains: autonomy, motivation, activities, and relationships (Table 1).

[1] MD Program, Faculty of Medicine, The University of British Columbia, Vancouver BC Canada

Correspondence to
Yuqing (Cindy) Ding (cindy.ding@alumni.ubc.ca)

Table 1 | Pre- and post-program interview questions.

Quality of life domain	Pre-program questions	Post-program questions
Autonomy: Empowerment refers to one's individual sense of self-determination and autonomy.	When do you feel like you have the power to make decisions that you feel are best suited for you? When do you not?	How has your participation in the program changed your power to make decisions that you feel are best suited for you?
Autonomy: Functional competence is defined to mean that, within their physical or cognitive abilities, residents were as independent as they wanted to be.	Within your physical and cognitive abilities, do you feel as independent as you would like to be? What does independence mean to you?	How has your participation in the program changed your level of independence?
Relationships: is defined as any relationship that the resident finds meaningful.	Can you describe your close relationships and the people you can confide in (i.e. other residents, family, staff, visitors)? Can you elaborate on what a meaningful relationship to you entails (i.e. physical, emotional, verbal, point of view)?	How has your participation in the program changed your relationships and people you can confide in (i.e. other residents, family, staff, visitors)?
Meaningful activity: encompasses activities outside of activities of daily living that gives individuals a sense of enjoyment.	What sort of activities are you participating in that give you enjoyment and are meaningful to you? Can you elaborate on what a meaningful activity means to you?	How has your participation in the program changed the activities you are participating in? Are you participating in more or less activities that give you sense of enjoyment and are meaningful to you?
Global motivation	What motivates you to take care of yourself (i.e. activities of daily living, hobbies)?	How has your participation in the program changed your motivations to take care of yourself?

Data collection and interview process

Prior to data collection, all researchers practiced interviewing peers with live feedback until no major discrepancies were noted between researchers. The training focused on asking neutral, non–leading, open–ended questions. Both pre–program and post–program semi–structured interviews were conducted by familiar researchers in quiet spaces of the residential facility to maintain participant comfort and good rapport. Interviewers obtained informed verbal consent prior to each interview, but they were otherwise unknown to the participants. Interviewer bias was mitigated by the use of five standardized, open–ended questions to address the four quality–of–life domains: autonomy, motivation, activities, and relationships (Table 1). The length of interviews ranged from 15 to 60 minutes.

All interviews were audio–recorded, transcribed, and assigned file numbers; no identifying information was attached. Researchers took note of affect and body language throughout the interview which, during transcription, provided qualitative context to responses. To further reduce interviewer bias, no participant was interviewed twice by the same researcher.

Data analysis

Each transcript was divided into four sections, corresponding to the four QoL domains. Within each domain, the transcripts were examined by at least two researchers using inductive coding. The inductive codes were then organized into categories. Categories that contained codes identified in at least half of the interviews were regarded as major themes. All researchers reviewed the final themes to ensure interpretation accuracy and consistency.

Results

Demographics

Between October 2015 and May 2016, eight participants took part in the study, four from Arbutus Care Centre and four from Point Grey Private Hospital. Of these, five were female and three were male. The participants were 63 to 95 years old, with an average age of 85 years. At the time of the final interview, the participants had lived at their current accommodations for 9 to 23 months, with an average length of stay of 14 months. Two participants from Point Grey Private Hospital were unable to follow up at the second interview; one had passed away, and one had transferred facilities. Full demographic information is provided in Table 2.

We assessed the relationship of GP to four QoL domains: motivation, activities, relationships and autonomy. Major themes identified in each domain include: 1) GP strengthened the participants' pre–existing motivations, 2) participants perceived social programs like GP to be enjoyable and beneficial while actively involved, 3) most participants found that GP did not affect their interpersonal relationships, and 4) GP did not affect the participants' self–perceived level of autonomy.

Motivation

In the pre–program interviews, the participants cited various global motivations, including pleasurable hobbies, valuable relationships, maintaining a presentable appearance, and a general passion for life. In the post–program interviews, three out of six participants stated they felt increased daily motivation. Of these, two were inspired to interact with others, and one was motivated to do rehabilitation exercises to look healthier and more youthful. It is notable that the GP program

Table 2 | Participant demographics.

Location	Sex	Age	Length of stay (months)	Follow-up
Arbutus Care Centre	M	63	11	Yes
	M	90	23	Yes
	F	90	20	Yes
	F	95	11	Yes
Point Grey Private Hospital	M	87	9	Yes
	F	80	19	Yes
	F	83	9	No – moved away
	F	90	12	No – passed away
Average age		85		
Average Length of Stay			14	

strengthened these participants' pre–existing motivations (Table 3).

Activities

All participants reported enjoying GP, citing reasons including a refreshing change in environment, improved mood, opportunity for interpersonal interactions, and opportunity to be engaged in an activity (Table 4). At the end of the program, no participants reported any change to the number or variety of activities they were involved in. All participants indicated that they would like to continue with the program in the future, although two expressed some reservations due to their old age.

Relationships

Participants emphasized that their most important relationships were with their family and long–time friends regardless of frequency of contact (Table 5). All participants found it difficult to build friendships within the care facilities, citing reasons like communication difficulties and lack of trust. None of the participants felt a sense of closeness with the staff; in general, they maintained an amicable working relationship. Involvement in GP generally did not impact the participants' relationships with family, fellow residents or staff. One participant noticed a significant improvement in interpersonal relationships; a social program like GP helped the participant become more outgoing (Table 6).

Autonomy

Participants defined autonomy as the freedom to make their own decisions and do the things they want. At the pre–program interviews, four out of eight participants felt autonomous, while others felt restricted by the care facility environment or by old age (Table 7). Participants reported no change in their self–perceived level of autonomy at the end of the program..

Discussion

Theme 1: GP strengthened the participants' pre–existing motivations

Guse and Masesar found that QoL was significantly improved when residents of a care facility felt that they were able to help others.[8] Thus, GP was framed as an opportunity for the senior participants to teach young children about life, aging, and residential care. It was thought that this would positively affect the seniors' global motivations domain and drive them to develop new healthy behaviours. However, we did not find this to be a major theme. Instead, we found that most seniors did not make any changes to their daily routines; only those who were already motivated to engage in healthy behaviours, such as interacting with others and performing rehabilitation exercises, felt more compelled to do so after participating in GP. It seems that the program did not create motivations towards one's health but did strengthen the participants' pre–existing motivations. While participant 3 increased his/her exercising after partaking in GP, he/she had always strived to be active to prevent becoming "a slob of a person". Our findings correlate with literature on motivation in institutionalized seniors, which found that personality is the major determinant of motivation,[9] making it difficult to change. Of note, a third of our participants stated that they felt too old for any lifestyle changes.

Table 3 | Comparison of participants' pre- and post-program motivations.

Pre-program opinions	Post-program opinions
"I have lots of friends, sometimes I join the community centre, do this and do that, and see a lot of friends." (P2)	*"After playing with the kids, I am more motivated to build relationships and value life more." (P2)*
"If I don't do it, I'm surely going to be a slob of a person." (P3)	*"Another activity that I have started to do myself is to get out of this chair, hold onto the handles and start walking because MS doesn't get better by itself, and you have got to keep the muscles working. You want to look good, not like a years old gran." (P3)*

Table 4 | Advantages and benefits of the Grandpal Penpals program identified by participants.

Theme identified (number of responses/total participants)	Participant opinions
Change in environment (3/6)	*"I liked going to the school. They have a lot more things going on at the school than we have for them here. I'd like to go back again." (P4)*
Improved mood (4/6)	*"Helped me with my mood. I read the letters, and it kind of boosted me up a little bit in the morning." (P4)* *"Oh I loved the visits. [The kids] all come running to you. That's the nicest feeling." (P6)*
Interpersonal interactions (5/6)	*"I enjoy social programs like Grandpal Penpals as I can converse and share thoughts with others. I feel happy seeing the students because they remind me of my past relationships with my kids." (P2)* *"I really enjoyed it, we really do correspond." (P3)*
Active Engagement (6/6)	*"At the care home, there are not many fun activities so seeing the students was quite refreshing." (P2)* *"If there are any activities I would be fascinated to learn about here. I don't know any activities going on." (P3)* *"It's got a real benefit. There's nothing here to do! That was great, one of the best things they've done." (P6)*

New motivations may be encouraged by helping seniors set meaningful and achievable goals.[9] Continuous active support by primary caregivers is also a major catalyst in increasing motivations.[10] In the future, participants of GP can partake in a goal–setting session with primary caretakers prior to starting the program. Throughout the program, primary caretakers and program leaders can utilize motivational techniques such as verbal cues and encouragement, role modelling and humour to help participants achieve their goals.[10] Potential barriers include participants' physical limitations, increased utilization of health care resources and staff training.

Theme 2: Seniors perceived social programs like GP to be enjoyable and beneficial while actively involved

All of the participants reported that life in residential care facilities was too monotonous, with too much spare time and too little stimulation. This finding is in line with the results of another study which showed that institutionalized seniors spend 65% of their time doing little or nothing, and only 12% of their time in social activities even in a facility with a high standard of care and a creative activities department.[11] GP was considered a refreshing change in environment that provided an opportunity for interpersonal interactions and additional activities. Most participants experienced markedly improved mood during letter writing and visits, and some improvement when they revisited the letters in between program activities.

To potentiate the benefits of the program, GP could increase the frequency of letter writing and visits. More visits could be held outside of the residential facilities, such as at schools and other public spaces. Older students may be able to accompany seniors to a greater variety of physically and mentally stimulating activities. These changes to GP

could further help break up the monotony that institutionalized seniors experience.

We hoped that a positive experience with GP would activate the seniors to seek out other rewarding activities; however, the seniors reported no change in the number or variety of activities. This is unlikely due to a lack of motivation as most seniors reported a desire to be involved in similar social programs. Half of the senior participants indicated that they were either unaware of or not interested in the activities offered by the care centre. More investigation is required to determine barriers seniors may face to participating in recreational activities, including whether care facilities are offering sufficiently diverse activities and properly advertising them to all residents.

Theme 3: Most participants found that GP did not affect their interpersonal relationships

A study by Moon found that long–term friend and family relationships greatly influenced QoL.[12] Similarly, the senior participants unanimously valued family and long–term relationships above all others, regardless of the frequency of contact. Previously, O'Connor found that the quality of relationships was a stronger predictor of life satisfaction in seniors than frequency of contact.[13] Considering that institutionalized seniors tend to form superficial relationships with fellow residents and staff,[14] it is understandable that they would place greater value on deep relationships with family members even if they scarcely visit. Furthermore, the senior participants often found it difficult to meet like–minded individuals in residential care. Higher functioning participants revealed it was difficult to converse with residents suffering from significant cognitive and physical decline. Previous studies support these sentiments; a common theme in peer interaction within care facilities is to stay away from individuals who cannot reciprocate.[15,16] Studies have found that residents tend to have superficial interactions with peers and staff; rarely do seniors discuss personal topics with them.[14] Despite this, encouraging interactions with fellow residents is important; in fact, one study suggested that participation in social activities outside the family may have a bigger positive impact on cognitive function than social contact with family members.[17]

All but one of the senior participants reported that they noticed no change in their relationships with family, fellow residents, and staff. One participant specifically indicated that he/she kept family relationships very private and separate from GP. Another participant was resigned to the idea that his/her relationships could not be changed. Only one participant indicated that the program helped him/her to become more outgoing, which benefitted all of his/her relationships. It appears that although GP could help develop social skills in those who are more shy, seniors face other barriers to making and maintaining relationships that were not addressed by GP.

Moving forward, potential improvements to GP include active facilitation of resident–resident interaction by care staff. For example, staff can help residents write letters in groups of two, which would allow the residents to converse about each other's pen pals. Setting more personal themes for the letters can encourage the residents to have deeper conversations with the students and with each other. The social visits can incorporate more activities that involve resident collaboration, as opposed to separating residents into their pen pal groups. Higher–functioning residents can even help to design and lead activities. To facilitate and preserve important connections with

Table 5 | Participants' opinions of their relationships with family, other care facility residents and staff.

Relationships	Participant opinions
Family	*"Just my family, really, they're the most meaningful." (P1)* *"I can hardly remember the last time I saw [my family]. I saw them a few times earlier in the year. My relationships with them are still very good though." (P5)* *"I have a son and 4 grandsons. I don't see them often because they all have busy schedules. I don't feel rejected by it because I understand what it is like to be busy." (P3)* *"I still have close relationships with them. When I fell and I was bound to a wheelchair, they still came to visit often, especially my eldest daughter." (P7)* *"Two or three old-aged ladies, we can meet together every one or two weeks." (P2)*
Other Residents	*"The people here are not mentally sound. I find it hard to make friendships. Some people here are hardly human beings." (P3)* *"The sociability here is not the same as the place I used to live in. We had a bridge game every afternoon, and you made friends with people. And here you don't seem to. The only people that I really talk to are three times a day at the meal." (P3)* *"Communicating with others and keeping their attention is a hard part." (P7)* *v* *"Well, most of them are asleep. So you can't make relationships with someone who's asleep." (P4)* *"They are alright. But I can't really confide in them. And some of the residents can't keep anything without telling somebody. So many of them are like that. So you have to be careful about what you tell them." (P6)* *"My associates, they are not close friends." (P5)* *"I wouldn't interact with them. I just wouldn't want to with them." (P1)*
Staff	*"I am not close with any of them. But most of them are quite nice, and they take care of things pretty well." (P5)*

Table 6 | Impact of the Grandpal Penpals program on interpersonal relationships.

Impact	Participant opinions
Improvement	*"It opened the doors for me. I'm not as shy as I was." (P6)*
No change	*"No, not really…You get used to the people around you." (P1)* *"Not really. It is a private relationship, and I certainly don't talk to them, especially the younger kids about [my family]." (P3)* *"It doesn't have any impact [on how I interact with others at the care home]." (P4)* *"I don't think there are any changes." (P5)*

Table 7 | Participants' pre-program opinions on their level of autonomy.

Level of autonomy	Participant opinions
Autonomous	*"I would say I have had control over my decisions for quite a while." (P7)* *"I can still go places that I like to go. I'm very happy with this." (P2)*
Non-autonomous	*"You have to sign a book at the desk... every time you go out. I don't want to do that." (P4)* *"Decisions in my life are coming to an end. I eat three meals a day. And I am allowed to read until 1 o'clock in the morning if I want to." (P3)*

family, one session of GP can focus on promoting technology use to seniors, such as video chat. Student participants are typically skilled with iPads and computers, and can teach their senior pen pals how to use these tools to communicate with family and friends. Potential barriers to promoting technology include cognitive limitations of some seniors, equipment access, and funding. The seniors may have a greater opportunity to develop meaningful relationships with the students if the program was extended over a few years with the same children. However, this is logistically difficult as students move to different classes each year.

Theme 4: GP had no impact on the participants' self–perceived level of autonomy

Many participants recognized the need for a residential care facility and had learned to live within their physical, cognitive, and environmental limits; these individuals did not perceive any loss of autonomy. This is contrary to existing literature which suggests that self–perceived autonomy increases with increased functional ability.[18] On the other hand, those who were adamant about independent living strongly despised the limitations that care facilities imposed on them; they felt that the rules made daily activities much more difficult. This is supported by a 2004 study that showed the nursing home environment required residents to overcome greater challenges to maintain their autonomy and activities of daily living than would have been expected at home.[19]

GP has little role in changing the rules of the care facilities; however, the program does expand the limits of what the seniors are allowed to do, such as leaving the care facilities for school visits. Participants expressed that more participation in the program may help improve their autonomy. Therefore, implementing more visits and increasing the duration of the program may potentiate its effects.

Research limitations

Although we designed the interview questions to be concise and direct, they were often still too abstract for our research participants to fully understand. In addition, the differences in rapport with different interviewers may affect participants' responses even though efforts were made to standardize the interviews.

Although we had excluded seniors with severe dementia who were incapable of providing informed consent, interviewing seniors with mild neurocognitive disorders was still a significant difficulty. Some participants had trouble sustaining attention through a 30–minute interview and occasionally found it difficult to associate GP with our interview questions. Researchers used frequent redirection and clarification to address this issue. It might appear simpler to exclude this population altogether, but as they make up a great percentage of seniors living in care facilities, inclusion is more reasonable for proper representation of our study population.

Differences between the two residential facilities might have impacted the participants' experiences. For example, the activity space in Arbutus Care Centre was much smaller than that in Point Grey Private Hospital, which led to a more crowded and noisy environment that participants may have found distracting. Also, participants at Point Grey Private Hospital did not have the transportation services to visit their pen pals at the elementary school, and thus did not experience a change in environment that other seniors found enjoyable.

We did not collect information on other factors that may have affected participants' experiences with GP, such as cultural background, language preference, medical conditions, experience with children, and personality.

Although invaluable detailed information has been collected from each participant, it is difficult to generalize the findings to a larger population with a small sample size of eight.

Conclusion

Our team conducted qualitative research to evaluate seniors' QoL in residential care facilities and how it may be affected by an intergenerational social activity like GP. Major themes were identified in the domains of motivation, activities, relationships, and autonomy: 1) GP strengthened the participants' pre–existing motivations, 2) participants perceived social programs like GP to be enjoyable and beneficial while actively involved, 3) most participants found that GP did not affect their interpersonal relationships, and 4) Grandpal Penpals did not affect the participants' self–perceived level of autonomy. In the future, we hope to investigate whether highly engaging, long–term social programs with increased senior–senior or senior–family interaction and individualized goal setting would be of greater benefit.

Acknowledgments

We thank our senior participants and staff at Point Grey Private Hospital and Arbutus Care Centre, the teachers and students involved with GP from Carnarvon Elementary and Queen Elizabeth Elementary, our University of British Columbia undergraduate student volunteers, and our advisor Dr. John Sloan.

Conflicts of interest

There are no conflicts of interest.

References

1. Statistics Canada, Population Projections for Canada, Provinces and Territories: 2009 to 2036 [Internet]. Ottawa, Ont.: Statistics Canada; c2010 [cited 2016 Sept 12]. Available from: http://www.statcan.gc.ca/pub/91-520-x/91-520-x2010001-eng.pdf.
2. Ames D. International psychogeriatrics: A useful development in measuring activities of daily living. Cambridge University Press. 2015 Sept;27:1417.
3. Canadian Institute for Health Information, Health Care in Canada, 2011: A Focus on Seniors and Aging [Internet]. Ottawa, Ont.: Canadian Institute for Health Information; c2011 [cited 2016 Sept 12]. Available from: https://secure.cihi.ca/free_products/HCIC_2011_seniors_report_en.pdf.
4. Glass TA, de Leon CM, Marottoli RA, Berkman LF. Population based study of social and productive activities as predictors of survival among elderly. *BMJ*. 1999;319:478.
5. WHOQOL: Measuring Quality of Life. WHO Division of Mental Health and Substance Abuse Prevention. 1997 Apr.
6. Wallerstein N. Powerlessness, Empowerment, and Health: Implications for Health Promotion Programs. *Am J Health Promot*. 1992;6(3):197-205.
7. Johnson DK, Niedens M, Wilson J, Swartzendruber L, Yeager A, Jones K. Treatment outcomes of a crisis intervention program for dementia with severe psychiatric complications: The Kansas Bridge Project. *Gerontologist*. 2003;53(1):102-12.
8. Guse LW, Masesar MA. Quality of life and successful aging in long-term care: perceptions of residents. *Issues Ment Health Nurs*. 1999;20(6):527-39.
9. Resnick B. Motivation to perform activities of daily living in the institutionalized older adult: can a leopard change its spots?. *J Adv Nurs*. 1999;29(4):792-9.
10. Galik EM, Resnick B, Pretzer-Aboff I. 'Knowing what makes them tick': motivating cognitively impaired older adults to participate in restorative care. *Int J Nurs Pract*. 2009;15:48–55.
11. Ice GH. Daily Life in a Nursing Home: Has it Changed in 25 Years?. *J Aging Stud*. 2002;16(4):345-59.
12. Moon MJ. A study on the instrumental activities of daily living and quality of life of elderly home residents. *Korean J Rehabil Nurs*. 2001;4(1):46-57.
13. O'Connor BP. Family and friend relationships among older and younger adults: interaction motivation, mood, and quality. *Int J Aging Hum Dev*. 1995;40(1):9-29.
14. Gutheil I. Intimacy in nursing home friendships. *J Gerontol Soc Work*. 1991;17(1):59-73.
15. Roberts T, Bowers B. How nursing home residents develop relationships with peers and staff: A grounded theory study. *Int J Nurs Stud*. 2015 Jan;52(1):57-67.
16. Casey AN, Low LF, Jeon YH, Brodaty H. Residents perceptions of friendship and positive social networks within a nursing home. *Gerontologist*. 2016;56(5):855-67.
17. Glei DA, Landau DA, Goldman N, Chuang YL, Rodriguez G, Weinstein M. Participating in social activities helps preserve cognitive function: an analysis of a longitudinal, population-based study of the elderly. *Int J Epidemiol*. 2005;34(4):864-71.
18. Hwang H, Lin H, Tung Y, Wu H. Correlates of perceived autonomy among elders in a senior citizen home: a cross-sectional survey. *Int J Nurs Stud*. 2006 May;43(4):429-37.
19. Sacco-Peterson M, Borell L. Struggles for autonomy in self-care: the impact of the physical and socio-cultural environment in a long-term care setting. *Scand J Caring Sci*. 2004 Dec;18(4):376-86.