JOURNAL of AGING and LONG-TERM CARE

--- A New 21st Century Initiative from Turkey ---

E-ISSN : 2618-6535 | ISSN : 2619-9017

Volume: 1 - Issue: 2 - 2018

Editor-in-Chief:
Emre SENOL-DURAK

Editor:
Mithat DURAK

A Journal of the
National Association of Social and Applied Gerontology (NASAG) - Turkey

JOURNAL of AGING and LONG-TERM CARE

www.agingandlongtermcare.com

Publication

The Journal of Aging and Long-Term Care (JALTC) is a journal of the National Association of Social and Applied Gerontology (NASAG) in Turkey. JALTC is published in three issues per annual volume.

ISSN

ISSN 2619-9017 | E-ISSN 2618-6535

Supporting Organization

National Social and Applied Gerontology Association (NASAG) is the first national organization making efforts to improve the living conditions of the older adults in Turkey. The activities of the NASAG are adapted to the society based on the theories and practices in the field of Social Gerontology. Address of NASAG: Ulusal Sosyal ve Uygulamalı Gerontoloji Derneği, Liman Mahallesi, 27. Sok. Tunalı Apt. No: 26/C, Antalya, Turkey, Tel. +90 242 259 26 86, Fax. +90 242 259 38 62, http://www.geroder.com

Printed in Turkey.

Subscription Information

Subscriptions: The Journal of Aging and Long-Term Care (JALTC) is published by NASAG, Liman Mahallesi, 27. Sok. Tunalı Apt. No: 26/C, Antalya, Turkey. Subscriptions for the 2018 volume are available only on a calendar-year basis.

Individual Rates for Print: Annual subscription in 2018, $400 for institutions and $200 for individuals.

Individual Rates for Online: All articles are available on the website of the journal with membership. The full text of the *Journal of Aging and Long-Term Care (JALTC)* is available online at http://agingandlongtermcare.com.

Payment: Payment may be made by check, international money order, or credit card to Ulusal Sosyal ve Uygulamalı Gerontoloji Derneği, Liman Mahallesi, 27. Sok. Tunalı Apt. No: 26/C, Antalya, Turkey.

Abstracted & Indexed in: Academic Journal Index, Academic Resource Index, Asos Index, Base, Cite Factor, Cosmos, CrossRef, Google Scholar, I2OR, Journal Factor, Open AIRE, Root Indexing, Scientific Indexing Service, & WordCat

Contact: Editor-in-Chief, Emre SENOL-DURAK

E-mail. editor-in-chief@jaltc.net

Address. Ulusal Sosyal ve Uygulamalı Gerontoloji Derneği, Liman Mahallesi, 27. Sok. Tunalı Apt. No: 26/C, Antalya, Turkey,
http://www.agingandlongtermcare.com

JOURNAL of AGING and LONG-TERM CARE
www.agingandlongtermcare.com

Contents

Volume: 1 Issue: 2 - 2018

JOURNAL of AGING and LONG-TERM CARE
www.agingandlongtermcare.com

ISSN 2619-9017 | E-ISSN 2618-6535

EDITORIAL

2018, 1(2), 53-54
doi: 10.5505/jaltc.2018.30974

Older Adults Suffering Different Health Problems and Implementation of Programs

Emre Senol-Durak[1]

Older adults are dealing with several physical illnesses. Their health problems are increasingly mentioned in the ongoing studies. According to the World Health Organization, several physical health losses (i.e., visual, auditory, motor) appear after the age of 60 years. Therefore, "healthy aging" is identified as a focal purpose among professionals working with other adults especially after WHO's report in 2015. The implementation of public policies about this purpose and increment in academic papers to describe the frame of "healthy aging" put forward the value of health (Peel, McClure, & Bartlett, 2005).

Despite the efforts to stay healthy, there is a high incidence of several chronic health problems among older adults. How professionals can encourage the internal or intrinsic capacity of older adults while dealing with several physical complications is questioned in the literature (Cesari et al., 2018). The inherent capacity can be physical and mental; for instance, having activity history during adulthood and having an optimistic attitude while dealing with stress. It is considered that to encourage intrinsic capacity; older adults may need professional help. In this respect, the integration of knowledge about an older adult is so valuable. A lot of information related to an older adult can be revealed by doctors, health-staff, gerontologists, psychologists, institutional staff, caregivers and family caregivers. However, the integration of that knowledge is quite valuable. For instance, a health-staff observation about the decrease in physical activity of an older adult can be evaluated as earlier signs of orthopedic problems for a doctor. In this case, earlier attended activity schedule can be set by a psychologist who monitors the activity to regain intrinsic capacity of an older adult. Therefore, building the body of knowledge together to promote "healthy aging" is crucial. Also, asking the own life preferences of older adults is needed to enhance "healthy aging" (see Figure-1) For instance, asking to older adult's preferences about activity schedule can increase voluntary involvement to the process.

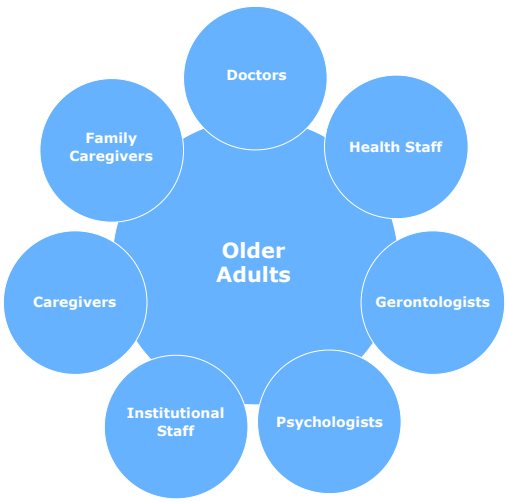

Figure-1. Knowledge Integration for healthy aging

We are proud to publish the second issue after the first issue. To build a body of knowledge to support healthy aging as aforementioned above, studies conducted in different subdisciplines is quite necessary. We believe that the Journal of Aging and Long-Term Care (JALTC) will fill an important gap in the literature since studies conducted in different subdisciplines are shared with our readers with sensitively revealed messages to practitioners. In this issue; four studies are emphasizing older adults are having different health problems and questioning the application and effect of institutional programs encouraging physical and mental capacity of older adults in respect to "healthy aging."

First, it is highlighted in the ongoing studies that there are higher numbers of older adults suffering from diabetes. In this study, what are some variables necessary for higher psychological functionality among diabetic patients is examined under posttraumatic growth phenomenon. Older adults

Correspondence: Emre Senol-Durak. Bolu Abant Izzet Baysal University, Department of Psychology Golkoy Kampusu, 14280, Bolu TURKEY. e-mail: editor-in-chief@jaltc.net
Author: [1] Department of Psychology, Bolu Abant Izzet Baysal University, TURKEY
Published Online: 30 August 2018

are having a higher number of children, and higher treatment adherence had higher growth. The role of familial support, treatment-related variables (i.e., being outpatient) and cognitive processing are emphasized. Encouraging posttraumatic growth among sufferers of several health problems are discussed in this study.

Second, supporting mobility among older adults is quite essential for "healthy aging." In this study, one mobility activity called "sit-to-stand activity" is evaluated in terms of its effectiveness among older adults with or without dementia living in long-term care facilities. Their mobility response is calculated by the time to complete a first sit-to-stand activity and the number of sit-to-stand in a restricted time interval. In respect to mobility activity, there are no differences observed among residents with dementia or not. Researchers discuss the value of low-cost and straightforward mobility based activities, especially in long-term care facilities.

Third, falls among older adults lead to serious health problems. In this study, an evidence-based practice falls prevention 8-week program is mentioned. Application to a program to nursing staff leads decrement in the percentage of falls and increment in the knowledge of nursing staff about falls prevention. Recommendations about educating nursing staff are discussed in the present study.

Lastly, new technological solutions offered to older adults is quite useful. In this study, application of Ambient Assisted Living solutions (AAL solutions) was evaluated among older adults. Technological changes are quite challenging among those people. Their willingness to use technology is affected by the perceived benefit from technology (i.e., having social communication with relatives living far away) as well as obtaining guidance from others while using technology. Also, the role of familiarity with technology is underlined in the present study.

Special thanks to all the authors who contributed to this issue. We wish to meet in the third issue of JALTC after Volume 2.

References

Cesari, M., Araujo de Carvalho, I., Amuthavalli Thiyagarajan, J., Cooper, C., Martin, F. C., Reginster, J. Y., ... & Beard, J. R. (2018). Evidence for the domains supporting the construct of intrinsic capacity. *The Journals of Gerontology: Series A*, *73*(12), 1653-1660. [Crossref]

Peel, N. M., McClure, R. J., & Bartlett, H. P. (2005). Behavioral determinants of healthy aging. *American Journal of Preventive Medicine*, *28*(3), 298-304. [Crossref]

WHO (World Health Organization) (2017). Integrated care for older people: guidelines on community-level interventions to manage declines in intrinsic capacity. Geneva: Licence: CC BY-NC-SA 3.0 IGO.

JOURNAL of AGING and LONG-TERM CARE
www.agingandlongtermcare.com

ISSN 2619-9017 | E-ISSN 2618-6535

ORIGINAL RESEARCH

2018, 1(2), 55-63
doi: 10.5505/jaltc.2018.36844

Posttraumatic Growth Among Turkish Older Adults with Diabetes

Emre Senol-Durak[1] Mithat Durak[1]

Abstract

Diabetes is one of the well-known chronic disorder affects older adults life dramatically. Psychological effects of diabetic patients have been mentioned in several studies that highlight negative psychological consequences on patients. However, chronic disorders like diabetes are also related to several positive psychological changes. One of the positive changes, posttraumatic growth has been mentioned in literature as increase positive life view, changes in social relationships, engage in purposeful life activities, be aware of life worth after experiencing life changes such as suffering from a chronic illness, diabetes. The aim of the present study is to investigate possible associations among socio-demographic variables, perceived social support, cognitive processing and posttraumatic growth among diabetic older adults. Data were collected from diabetic older adults (N= 191) living in Turkey. Results revealed that a higher number of children, being outpatient and higher dietary adherence were associated with the PTG. After controlling the effect of socio-demographic variables, treatment-related variables, perceived social support received from family, and avoidance dimension of cognitive processing were significantly related with posttraumatic growth. Results were discussed in the sample of older adults.

Keywords: Posttraumatic growth, cognitive processing, perceived social support, social support from family, avoidance, and number of children.

Key Practitioners Message

- When considering the ratio of diabetes among older adults is increasing, building a development strategy about growth is crucial.
- Encouraging familial support is important for diabetic older adults.
- Avoidance of diabetes is related to the PTG for diabetic older adults.

Older adults have suffered from several physical illnesses that make a significant difference in their life quality. Conducted studies largely emphasize negative effects of these physical illnesses on older adults such as depression (Aakhus, Flottorp, & Oxman, 2012; Abe, Fujise, Fukunaga, Nakagawa, & Ikeda, 2012; Cuijpers, de Wit, Kleiboer, Karyotaki, & Ebert, 2018), anxiety (Andreescu et al., 2009; Mohlman, Eldreth, Price, Staples, & Hanson, 2017; Niles et al., 2015) and sleep disorders (Pouwer, Kupper, & Adriaanse, 2010). On the other hand, recent studies focus on whether physical illnesses lead positive experiences such as resilience (Hardy, Concato & Gill, 2004; Smith & Hollinger Smith, 2015) and posttraumatic growth (Tedeschi et al., 2018; Senol-Durak, 2014).In this respect, positive experiences among individuals suffering breast cancer (Ho, Chan, Yau, & Yeung, 2011; Tedeschi et al., 2018), heart disease (Senol-Durak & Ayvasık, 2010), traumatic brain injury (Stoner, Orrell, & Spector, 2015) and diabetes (Senol-Durak, 2014) have been examined in various studies by posttraumatic growth which is defined as increase in positive life view, change in social relationships, engage in purposeful life activities, be aware of life worth after experiencing life changes (Tedes-

Correspondence: Emre Senol-Durak. Department of Psychology, Bolu Abant Izzet Baysal University, Golkoy Kampusu, 14280, Bolu, TURKEY. e-mail: emresenoldurak@gmail.com
Authors: [1] Department of Psychology, Bolu Abant Izzet Baysal University, TURKEY

Received: 4 January 2018 | *Accepted:* 22 February 2018 | *Published Online:* 28 March 2018

National Association of Social and Applied Gerontology

chi et al., 2018; Tedeschi, Cann, Taku, Senol-Durak, & Calhoun, 2017). On the other hand, posttraumatic growth among diabetic patients has examined in few studies although diabetes leads several life-threatening complications such as organ failure or loss.

The prevalence rate of diabetes has increased to 12.4% from 2005 to 2010 while it was 5.8% from 1988 to 1994 in the United States (Selvin, Parrinello, Sacks, & Coresh, 2014). The World Health Organization reported that there are 420 million individuals suffering from diabetes (WHO, 2016). Among 75 years older individuals, the ratio will be expected to be 449% in 2050 (Huang et al., 2014). Diabetes, being commonly observed among older adults (Huang et al., 2014), includes several complications. Dealing with those complications increases stress (Horsch, McManus, Kennedy, & Edge, 2007), particularly emotional stress (Pouwer et al., 2010) and researchers put emphasis on the importance of familial support (Rana, Rufus, Seema, & Nandinee, 2016). In a longitudinal study, distress scores of the most of diabetic patients (71%) increased during a 9-month period (Fisher et al., 2016). In this study, variables related to diabetes (i.e., treatment adherence etc.) were associated with diabetes-related stress. To see the effect of stress among those patients, PTSD is reported in some studies (i.e., Goodwin & Davidson, 2005) while diabetes-related distress is specifically identified in other studies (Fisher et al., 2016). In addition to stress, likewise diabetic patients in other age range, diabetic older adult patients are highlighted to experience burnout related to illness (Pouwer et al., 2010). Especially, decreased level of functionality among older adult patients make diabetic treatment more complicated (Chau & Edelman, 2001) and diet and weight are mentioned to be two demanding issues in diabetes (Nagelkerk, Reick, & Meengs, 2006).

During the treatment process, using effective coping strategies is noted to be important for the adjustment of diabetic patients (García-Mayor, & Larrañaga, 2011). Moreover, some positive experiences of diabetic patients have also been studied regarding spiritual growth (Cagle, Appel, Skelly, & Carter-Edwards, 2002) and psychological resilience (Wee, Lee, Ravens-Sieberer, Erhart, & Li, 2005). Another positive experience observed in social relationships, spiritual growth, awareness of new possibilities and appreciation of life, posttraumatic growth (PTG) (Tedeschi et al., 2018), among diabetic patients has not been extensively studied in the literature. In a study conducted with diabetic patients, higher social support especially received from family, higher self-esteem and higher cognitive processing including rumination, hypervigilance and avoidance dimensions were related with posttraumatic growth (Senol-Durak, 2014). Similarly, the relationship between PTG and cognitive processing was reported as significantly positive in a cross-cultural study (Tedeschi, Cann, Taku, Senol-Durak, & Calhoun, 2017). In another study, lower education level, perceived social support, self-efficacy about diabetes management, problem-focused and optimistic coping were associated with posttraumatic growth (Dirik, & Gocek-Yorulmaz, 2018). Also, there was a significant positive correlation between social support and adherence to dietary, weight loss, and sports in a sample of diabetic patients (Kirk, Ebert, Gamble, & Ebert, 2013). Other PTG studies conducted with different samples have been mentioned positive correlation with PTG and number of child (Senol-Durak, 2007; Turner-Sack, Menna, & Setchell, 2012), being women (Morris, & Shakespeare-Finch, 2011; Senol-Durak, 2007) and younger age (Morris, & Shakespeare-Finch, 2011).

Taking into consideration that diabetes is increasing among older adult population dramatically in the future (Huang et al.,2014), developing psychological strategies to handle diabetes-related stress is essential. In the past decade, professionals have questioned how they can prevent developing psychopathology (i.e., depression or anxiety) among adults having diabetes. Changing focus from psychopathology to grow will help professionals to deal with diabetes-related stress and studies demonstrated adjustment (García-Mayor, & Larrañaga, 2011) and growth among diabetic patients (Gocek-Yorulmaz & Dirik, 2018; Senol-Durak, 2014). On the other hand, those studies were conducted with adult populations. There were no PTG studies conducted with older adult

diabetic patients, although diabetes is commonly seen among older adults (Huang et al.,2014) and several complications are experienced by them. Therefore, interrogating variables associated with the PTG is crucial in order to manage diabetes in a better way. Understanding associations between the PTG and socio-demographic variables (age, gender, number of children), treatment status, treatment adherence (diet adherence, sports adherence, weight loss adherence, non-smoking adherence, and no alcohol adherence), social support and cognitive processing are aimed to examine in the present study. The present study hypothesized that those variables would be significantly correlated with the PTG.

Methods

Participants

A total of 191 older adults with diabetes whose ages ranged between 65 and 81 years (M = 69.16, SD = 3.92) participated in the present study. Among those participants, 79 were men (41.4%) and 112 were women (58.6%). The majority of those patients were primary school graduates (N = 158; 82.7%) and married (N = 143; 74.9%). The number of children was between 0 and 6 and (M =3.91, SD = 1.57). Again, the majority of these patients reported that they live in the city (N = 88; 46.1%) and have social security (N = 181; 94.8%) (see Table-1).

Regarding illness related variables, 79 were inpatient (41.4%) and 112 were outpatient (58.6%). 49.7% of them (N = 95) had history of prior hospitalization, while 50.3% (N = 96) of them receive only outpatient treatment. Among hospitalized patients, 52.6% of them (N = 50) had hospitalization for the first time. In terms of the type of treatment received, patients applied to different types of treatment: medication (N = 89; 46.6%), insulin (N = 14; 7.3%), and both insulin and medication (N = 88; 46.1%). Most of the participants suffered another illnesses (N = 147; 77.0%).

Materials

Demographic Information Form included personal characteristics (e.g., age, education level, marital status, etc.), health-related variables (e.g., treatment status, treatment type, presence of other medical illnesses), and treatment adherence (e.g., diet adherence, sports adherence, weight loss adherence, non-smoking adherence, and no alcohol adherence). To identify treatment adherence, individuals respond how they had adhered to dietary, sports, non-smoking, no alcohol intake before receiving a diagnosis in a 4 point Likert scale. In addition, they responded how they adhered to those aspects after receiving diabetes diagnosis. To calculate total adherence score, the difference between those two scores (before and after diagnosis) was taken into account for each parameter (i.e., sports adherence= sports adherence before diagnosis - sports adherence after diagnosis). Therefore, treatment adherence scores were ranged in between -4 to +4.

The Post-Traumatic Growth Inventory (PTGI), is a 21 item six-point Likert type measure to assess the positive changes when encountering any kind of traumatic events (Tedeschi & Calhoun, 1996). Dirik (2006) translated the scale into Turkish and she found .94 internal consistency.

IES-R Impact of Events Scale - Revised is aimed to evaluate ruminations, hypervigilance, and avoidances with a 22 item five-point Likert type scale (Horowitz, Wilner, & Alvarez, 1979). Three-factor structure of the scale was found in the Turkish version as well and internal consistencies were ranged between .82 to .93 (Isikli, 2006).

Multidimensional Scale of Perceived Social Support (MSPSS) is aimed to evaluate perceived social support receives from friends, family, and significant others with a 12 item (Zimet, Dahlem, Zimet, & Farley, 1988). Turkish adaptation revealed the three-factor structure which was consistent with the developers' result (Eker, Akar, & Yaldız, 2000).

Procedure

The ethical and legal approval was taken from Abant Izzet Baysal University, Ankara Kecioren Education and Research Hospital and Provincial Directorates of Health in Ankara, Bolu. After informing patients about the study, scales were administered to them. It took 20-25 minutes to complete questionnaires.

Results

Preliminary analysis

The possible ranges, means, standard deviations, and correlations for all study variables were displayed in Table-1. The PTG scores were closely correlated to subscales of IES-R, subscales of MPSS, number of children, and the adherence of diet, sports, and weight loss.

Hierarchical regression results for PTG

The significant associates of post-traumatic growth were revealed by performing hierarchical regression analysis in which variables were entered into the equation via three steps.

The possible effects of personal (i.e., age, gender, number of children), health-related (i.e., presence of other medical illnesses, treatment status, treatment type, and time since diagnosis), and adherence after diagnosis (i.e., sports, diet, weight loss, non-smoking, and no alcohol) were entered into the equation on the first step via the enter method. The variables of perceived social support (i.e., PSS family, PSS friends, and PSS significant others) were entered into the equation on the second step via enter method. Finally, on the third step, the variables of the impact of the event (i.e., rumination, hypervigilance, and avoidance) were entered into the equation via the enter method.

On the first step, "number of children" (β = .14, $t(177)$ = 2.07, p = .039725), "treatment status (being outpatient)" (β = -.34, $t(177)$ = -4.95, p = .000002), and "diet adherence" (β = .22, $t(177)$ = 2.99, p = .003226) had significant association with post-traumatic growth, and these variables explained 30.3% of the variance ($F[12, 177]$ = 6.40, p = .000001).

On the second step, just "perceived social support from family" (β = .24, $t(174)$ = 3.56, p = .000476) had significant association with post-traumatic growth, and with the entrance of dimensions of perceived social support variables explained variance increased to 40.8% ($F[3, 174]$ = 10.30, p = .000003).

Table-1: The descriptive statistics of the variables and the correlations among the variables for older adults with diabetes (N = 191)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Posttraumatic Growth		.50***	.47***	.61***	.38***	.28***	.39***	.26***	.16*	-.01	.33***	.23**	.24***	.08	.14
2. Rumination			.85***	.51***	.10	.13	.27***	.29***	.06	-.03	.18*	.22**	.24***	-.05	-.03
3. Hypervigilance				.53***	.03	.06	.21**	.34**	.15*	-.02	.13	.16*	.12	-.06	-.07
4. Avoidance					.25***	.20**	.32***	.31***	.08	.00	.14*	.19*	.09	.05	.09
5. PSS Family						.27***	.47***	.07	-.01	.01	.18*	-.02	.07	.04	.12
6. PSS Friends							.60***	-.02	-.08	.03	.24***	.16*	.18*	.03	.11
7. PSS Significant Others								.14*	-.02	-.01	.22	.12	.26***	.10	.20**
8. Number of Children									.13	-.13	.07	.10	.08	.03	-.03
9. Age										-.09	.00	.04	.05	-.04	-.03
10. Time since Prognosis (days)											.11	.02	.05	.13	.11
11. Diet Adherence												.28***	.49***	.07	.17*
12. Sport Adherence													.42***	.05	.13
13. Weight Adherence														.16*	.21
14. Non-Smoking Adherence															.61***
15. No Alcohol Adherence															
Mean	43.14	9.96	8.54	9.92	22.84	15.37	17.06	3.91	69.16	3949	1.92	0.61	1.35	0.67	0.45
Standard Deviation	26.94	9.05	7.40	7.29	7.36	9.71	9.22	1.57	3.92	3128	1.47	1.75	1.62	1.48	1.22
Minimum	0	0	0	0	4	4	4	0	65	1	-1	-4	-4	-4	-2
Maximum	104	30	24	31	28	28	28	6	81	14600	4	4	4	4	4
Possible Range	0 - 105	0 - 40	0 - 30	0 - 40		4 – 28		0 - 6$^{\Psi}$					(-4) – (+4)		

Note 1: PSS = Perceived social support from
Note 2: * = p < .05., ** = p < .01., *** = p < .001.
Note 3: $^{\Psi}$ = Real range

On the third step, just "avoidance" (β = .35, t(171) = 5.32, p = .000001), had significant association with post-traumatic growth, and with the entrance of cognitive processing dimensions explained variance increased to 55.8% (F[3, 171] = 19.34, p = .000001). The results of the hierarchical regression analysis were displayed in Table-2.

Discussion

The diabetes-related threats on the psychological well-being of patients have been extensively mentioned in the literature. However, the positive outcome of the illness (i.e., posttraumatic growth) has not been studied broadly. The possible associations between the PTG and socio-demographic variables (age, gender, number of children), treatment status, treatment adherence (diet adherence, sports adherence, weight loss adherence, non-smoking adherence, and no alcohol adherence), social support and cognitive processing were aimed to investigate in this study. For this purpose, older adult diabetic patients were selected for the first time to reveal variables associated with the PTG and specific to this population.

Concerning the socio-demographic variables, only "the number of children" was significantly associated with the PTG. Patients with a higher number of children had higher PTG scores, likewise seen in other studies conducted with different samples (Senol-Durak, 2007; Turner et al., 2012). The reason why these two variables were associated is that older adults might need the help of their children related to involvement to treatment. In addition to this variable, inpatients had higher scores of the PTG as compared with outpatients. Older adults having treatment at a hospital might receive more attention for their treatment from hospital staff (i.e. doctors, nurses) and they might feel they are under control. Therefore, outpatients had higher scores of the PTG. Also, among treat-

Table-2: Variables associated with posttraumatic growth among older adults with diabetes

DV: Post Traumatic Growth

Set	Predictors in set	F for set	t for w/in set Predictors	df	Beta (β)	Model R^2 Change
I.	*Personal, Health-Related, and Behavioral Change Variables*	6.40***		12,177		.30
	Age		1.04	177	.07	
	Gender (being men)		.42	177	.03	
	Number of Children		2.07*	177	.14	
	Presence of Other Medical Illnesses		-.01	177	-.01	
	Treatment Status (being outpatient)		-4.95***	177	-.34	
	Treatment Type		-1.07	177	-.07	
	Time since Diagnosis		.18	177	.01	
	Diet Adherence		2.99**	177	.22	
	Sports Adherence		.77	177	.05	
	Weight Loss Adherence		.59	177	.05	
	Non-Smoking Adherence		.26	177	.02	
	No Alcohol Adherence		1.06	177	.09	
II.	*Perceived Social Support*	10.30***		2, 174		.11
	PSS Family		3.56***	174	.24	
	PSS Friends		1.52	174	.12	
	PSS Significant Others		.85	174	.07	
III.	*Impact of Event*	19.34***		1, 171		.15
	Rumination		1.59	171	.17	
	Hypervigilance		.25	171	.03	
	Avoidance		5.32***	171	.35	

Note-1: * = p ≤ .05, ** = p ≤ .01, *** = p ≤ .001

ment adherence variables, only higher diet adherence was associated with the higher PTG. As mentioned before, diet adherence is important in the prognosis of diabetes (Nagelkerk et al., 2006). When interacting with diabetic older adults, they shared their experiences about what sorts of food increase their insulin level. In addition, they share positive feelings when consuming healthier foods. Therefore, it can be said that they have selective attention to dietary in their regular life. On the other hand, other adherences (adherence to sports, no smoking, and no alcohol intake) were not related with the PTG. This insignificance is due to the sample characteristics. The sample is composed of older adults who have limits for smoking, alcohol, and exercising. Therefore, the role of those adherences is recommended to investigate among adults and adolescents in the future.

Regarding the role of perceived social support, individuals having higher family support had higher PTG scores. Same results obtained from diabetic older adults as well (Senol-Durak, 2014). In a collectivistic culture, the family is so close to the health problems of their members. Additionally, among cognitive processing variables, only avoidance was associated with the PTG. Likewise, avoidance is accepted as a unique predictor of depression and anxiety in the older adults (Andrew & Dulin, 2007), it was the only dimension associated with the PTG. Therefore, specific cognitive processing variable for diabetic older adults is avoidance. The role of avoidance on PTG was also seen in other studies conducted with either diabetic patients (Senol-Durak, 2014) or different samples (Senol-Durak & Ayvasık, 2010) but in those studies, other cognitive processing domains (rumination and hypervigilance) were also significantly associated with the PTG.

The current study was conducted with diabetic older adults. Therefore, results should not be interpreted other diabetic patients with different age ranges. Variables entered to regression equation explained 55.8% of the variance in the PTG that is quite high. Further studies are encouraged to see the consistency of findings. Also, in respect to variables entered into first equation (diet adherence, inpatients) the role of locus of control is questioned for further studies.

Regarding clinical implications, as mentioned before, facilitating growth over individuals should be one of agenda of professionals (Senol-Durak & Ayvasık, 2010). Considering results, professionals developing the PTG program can focus on more with older adult patients having a lower number of children or no children, outpatients and patients with lower diet adherence since those individuals had lower PTG scores. In order to convey are needed more attention to intervene. In addition, psychoeducation programs for diabetic patients and their families can be developed especially for individuals having lower family support. With the help of intervention programs at health services, stressful nature of diabetes will promote posttraumatic growth for sufferers.

Acknowledgement

This research was supported by a grant from The Scientific and Technological Research Council of Turkey (TUBITAK) (Project No: SOBAG-109K528).

References

Aakhus, E., Flottorp, S. A., & Oxman, A. D. (2012). Implementing evidence-based guidelines for managing depression in elderly patients: a Norwegian perspective. *Epidemiology and Psychiatric Sciences, 21*(3), 237-240. [Crossref]

Abe, Y., Fujise, N., Fukunaga, R., Nakagawa, Y., & Ikeda, M. (2012). Comparisons of the prevalence of and risk factors for elderly depression between urban and rural populations in Japan. *International Psychogeriatrics, 24*(8), 1235-1241. [Crossref]

Altintas, E., Gallouj, K., & Guerrien, A. (2012). Social support, depression and self-esteem in older persons: Cluster analysis results. *Annales Medico-Psychologiques, 170*(4), 256-262. [Crossref]

Alexopoulus, G. S. (2005). Depression in the elderly. *Lancet, 365*, 1961-1970. [Crossref]

Andreescu, C., Lenze, E. J., Mulsant, B. H., Wetherell, J. L., Begley, A. E., Mazumdar, S., & Reynolds, C. F. III

(2009). High worry severity is associated with poorer acute and maintenance efficacy of antidepressants in late-life depression. Depression & Anxiety, 26(3), 266-272. [Crossref]

Andrew, D. H., & Dulin, P. L. (2007). The relationship between self-reported health and mental health problems among older adults in New Zealand: experiential avoidance as a moderator. *Aging & Mental Health, 11*(5), 596-603. [Crossref]

Cagle, C. S., Appel, S., Skelly, A. H., & Carter-Edwards, L. (2002). Mid-life African-American women with type 2 diabetes: Influence on work and the multicaregiver role. *Ethnicity and Disease, 12*(4), 555–566.

Chau, D., & Edelman, S. V. (2001). Clinical management of diabetes in the elderly. *Clinical Diabetes, 19*(4), 172-175. [Crossref]

Conwell, Y., Duberstein, P. R., & Caine, E. D., Risk factors for suicide in later life, *Biological Psychiatry, 52* 193-204, 2002. [Crossref]

Cuijpers, P., de Wit, L., Kleiboer, A., Karyotaki, E., & Ebert, D. D. (2018). Problem-solving therapy for adult depression: An updated meta-analysis. *European Psychiatry, 48,* 27-37. [Crossref]

Dirik, G. (2006). *Predictor variables of depression, anxiety and posttraumatic growth among rheumatoid arthritis patients.* Unpublished doctoral thesis, Middle East Technical University, Ankara.

Dirik, G., & Gocek-Yorulmaz, E. (2018). Positive Sides of the Disease: Posttraumatic Growth in Adults with Type 2 Diabetes. *Behavioral Medicine, 44*(1), 1-10. [Crossref]

Eker, D., Arkar, H., & Yaldiz, H. (2000). Generality of support sources and psychometric properties of a scale of perceived social support in Turkey. *Social Psychiatry and Psychiatric Epidemiology, 35*(5), 228–233.

Fisher, L., Hessler, D., Polonsky, W., Strycker, L., Masharani, U., & Peters, A. (2016). Diabetes distress in adults with type 1 diabetes: prevalence, incidence and change over time. *Journal of Diabetes and its Complications, 30*(6), 1123-1128. [Crossref]

Fortune, D. G., Richards, H. L., Griffiths, C. E. M., & Main, C. M. (2005).Adversarial growth in patients undergoing treatment for psoriasis: A prospective study of the ability of patients to construe benefits from negative events. *Psychology, Health & Medicine, 10*(1), 44-56. [Crossref]

Francis, H. M., (2004). The relationship between personal and environmental resources, subjective experience with trauma, and posttraumatic growth in low socioeconomic individuals with cancer. *Dissertation Abstracts International: Section B: The Sciences and Engineering, 64*(7-B), 3525

García-Mayor, R. V., Larrañaga, A. (2011). Inadequate coping attitudes, disordered eating behaviours and eating disorders in type 1 diabetic patients. In L. Chih-Pin (Ed.), *Type 1 Diabetes-Complications, Pathogenesis, and Alternative Treatments* (pp. 95-118). Croatia: Intech Open Access. [Crossref]

Goodwin, R. D., & Davidson, J. R. (2005). Self-reported diabetes and posttraumatic stress disorder among adults in the community. *Preventive Medicine, 40*(5), 570–574. [Crossref]

Helgeson, V. S., Reynolds, K. A., & Tomich, P. L. (2006). A meta-analytic review of benefit finding and growth. *Journal of Consulting and Clinical Psychology, 74*(5), 797-816.

Ho, S. M., Chan, M. W., Yau, T. K., & Yeung, R. M. (2011). Relationships between explanatory style, posttraumatic growth and posttraumatic stress disorder symptoms among Chinese breast cancer patients. *Psychology & Health, 26*(3), 269-285. [Crossref]

Horsch, A., McManus, F., Kennedy, P., & Edge, J. (2007). Anxiety, depressive, and posttraumatic stress symptoms in mothers of children with type 1 diabetes. *Journal of Traumatic Stress, 20*(5), 881-891. [Crossref]

Horowitz, M., Wilner, N., & Alvarez, W. (1979). Impact of event scale: A measure of subjective stress. *Psychosomatic Medicine, 41*(3), 209–218.

Huang, E. S., Laiteerapong, N., Liu, J. Y., John, P. M., Moffet, H. H., & Karter, A. J. (2014). Rates of complications and mortality in older patients with diabetes mellitus: the diabetes and aging study. *JAMA Internal Medicine,174*(2), 251-258. [Crossref]

Isıklı, S. (2006). *Relations between attentional bias regarding the incident, peritraumatic dissociation and working memory span in individuals with post-traumatic stress symptoms.* Unpublished doctorate thesis, Hacettepe University, Ankara.

Kirk, J. K., Ebert, C. N., Gamble, G. P., & Ebert, C. E. (2013). Social support strategies in adult patients with diabetes: a review of strategies in the USA and Europe. *Expert Review of Endocrinology & Metabolism, 8*(4), 379-389. [Crossref]

Langa, K. M., Vijan, S., Hayward, R. A., Chernew, M. E., Blaum, C. S., Kabeto, M. U., et al. (2002). Informal caregiving for diabetes and diabetic complications among elderly Americans. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 57*(3), S177-S186. [Crossref]

Mohlman, J., Eldreth, D. A., Price, R. B., Staples, A. M., & Hanson, C. (2017). Prefrontal-limbic connectivity during worry in older adults with generalized anxiety disorder. *Aging & Mental Health, 21*(4), 426-438. [Crossref]

Morris, B. A., & Shakespeare-Finch, J. (2011). Cancer diagnostic group differences in posttraumatic growth: Accounting for age, gender, trauma severity, and distress. *Journal of Loss and Trauma, 16*(3), 229-242. [Crossref]

Nagelkerk, J., Reick, K., & Meengs, L. (2006). Perceived barriers and effective strategies to diabetes self-management. *Journal of Advanced Nursing, 54*(2), 151-158. [Crossref]

Niles, A. N., Dour, H. J., Stanton, A. L., Roy-Byrne, P. P., Stein, M. B., Sullivan, G., ... & Craske, M. G. (2015). Anxiety and depressive symptoms and medical illness among adults with anxiety disorders. *Journal of Psychosomatic Research, 78*(2), 109-115. [Crossref]

Pouwer, F., Kupper, N., & Adriaanse, M. C. (2010). Does emotional stress cause type 2 diabetes mellitus? A review from the European Depression in Diabetes (EDID) Research Consortium. *Discovery Medicine, 9*(45), 112-118.

Rana, S., Rufus, N., Seema, N. N., & Nandinee, D. (2016). Role of Expressed Emotion and Gender in Adversarial Growth of People with Type 2 Diabetes. *Journal of the Indian Academy of Applied Psychology, 42*(2), 264.

Senol-Durak, E. (2014). Stress related growth among diabetic outpatients: role of social support, self-esteem, and cognitive processing. *Social Indicators Research, 118*(2), 729-739. [Crossref]

Senol-Durak, E. (2007). *Environmental and individual resources, perception of the event, cognitive processing and coping as factors leading to posttraumatic growth among the survivor of myocardial infarction patients and their spouses.* (Ph.D. Doctorate Thesis), Middle East Technical University.

Senol-Durak, E., & Ayvasik, H. B. (2010). Factors associated with posttraumatic growth among myocardial infarction patients: perceived social support, perception of the event and coping. *Journal of Clinical Psychology in Medical Settings, 17*(2), 150-158. [Crossref]

Selvin, E., Parrinello, C. M., Sacks, D. B., & Coresh, J. (2014). Trends in prevalence and control of diabetes in the United States, 1988–1994 and 1999–2010. *Annals of Internal Medicine, 160*(8), 517-525. [Crossref]

Smith, J. L., & Hollinger-Smith, L. (2015). Savoring, resilience, and psychological well-being in older adults. *Aging & Mental Health, 19*(3), 192-200. [Crossref]

Tedeschi, R. G., & Calhoun, L. G. (1996). The posttraumatic growth inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress, 9*(3), 455–471. [Crossref]

Tedeschi, R. G., Cann, A., Taku, K., Senol-Durak, E., & Calhoun, L. G. (2017). The Posttraumatic Growth Inventory: A Revision Integrating Existential and Spiritual Change. *Journal of Traumatic Stress, 30*(1), 11-18. [Crossref]

Tedeschi, R. G., Shakespeare-Finch, J., Taku, K., Calhoun, L. G., Aboelela, S., Larson, E., . . . Glied, S. (2018). Posttraumatic growth in cancer patients and partners-effects of role, gender and the dyad on couples' posttraumatic growth experience. In *Posttraumatic Growth: Theory, Research, and Applications* (Vol. 42, pp. vii-viii): Brunner/Mazel Washington, DC.

Turner-Sack, A. M., Menna, R., & Setchell, S. R. (2012). Posttraumatic growth, coping strategies, and psychological distress in adolescent survivors of cancer. *Journal of Pediatric Oncology Nursing, 29*(2), 70-79. [Crossref]

WHO (World Health Organization) (2016). Global report on diabetes. WHO Library Cataloguing-in-Publication Data.

Wee, H. L., Lee, W. W. R., Ravens-Sieberer, U., Erhart, M., & Li, S. C. (2005). Validation of the English version of the KINDL® generic children's health-related quality of life instrument for an Asian population - results from a pilot test. *Quality of Life Research, 14* 1193-1200. [Crossref]

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment, 52*(1), 30–41. [Crossref]

JOURNAL of AGING and LONG-TERM CARE
www.agingandlongtermcare.com

ISSN 2619-9017 | E-ISSN 2618-6535

ORIGINAL RESEARCH

2018, 1(2), 65-72
doi: 10.5505/jaltc.2018.52724

Effect of a Sit-To-Stand Activity on Mobility Outcomes Among Canadian Continuing Care Residents with and Without Dementia

Susan E. Slaughter[1] & Carla Ickert[1] C. Allyson Jones[2] Jeffrey A. Bakal[3]

Abstract

The demand for continuing care facilities to support older adults in Canada is expected to increase. Currently, access to rehabilitation and recreation services is limited among this group of older adults. Identifying simple mobility interventions implemented by usual care staff may be a cost-effective way to maintain or improve mobility among older adults in continuing care. This study evaluated the effectiveness of a mobility activity, the sit-to-stand activity, on mobility outcomes of long-term care and supportive living residents with and without dementia. Fifteen supportive living facilities and eight long-term care facilities participated. Eligible residents were aged ≥ 65 years, medically stable and able to stand up from a chair. Facility healthcare aide staff received training on the sit-to-stand activity by study educators and were asked to complete the activity with participating residents four times daily. Staff documented completion of the activity on flowsheets. Two mobility outcomes, time to complete first sit-to-stand and number of sit-to-stand repetitions completed in 30-seconds, were measured by research assistants at the beginning and end of the trial for all participants. Demographic information, including age, sex, and dementia diagnosis, was gathered from health records. Data were analyzed using receiver operating characteristic curves and logistic regression. Across all 296 residents, mean time to complete the first sit-to-stand at baseline was 5.58 seconds (SD = 4.20) and the final mean time was 4.63 (SD = 3.71) seconds ($p < .001$). Dementia did not show a significant effect in likelihood of losing repetitions ($p = .12$) or time ($p = .12$). Residents in supportive living facilities were approximately half as likely as their long-term care counterparts to gain two or more seconds on their time for the first sit-to-stand (adjusted odds ratio = 0.48; 95% CI: 0.26-0.88, $p = .02$). The sit-to-stand activity is a low-cost, simple mobility intervention that may improve mobility of older adults in continuing care.

Key Practitioners Message

- Older adults in Canadian continuing settings have limited access to rehabilitation and recreation therapies
- Usual care staff may be able to implement mobility activities to sustain resident mobility, which is essential for quality of life and lowering care costs
- A simple mobility intervention, the sit-to-stand activity, can be implemented by usual care staff and may help frail older adults maintain mobility
- The mobility of both residents with and without dementia can benefit from the sit-to-stand activity

Introduction

The number of people age 65 and older is rapidly increasing in Canada, with the most pronounced increase occurring among the oldest old, aged 80 and over (Statistics Canada, 2013). This older segment of the population is one of the heaviest healthcare users in Canada and will drive an increase in need for access to continuing care facilities (CIHI, 2017a). Currently, 93% of residents in continuing care are over the age of 65, with the residents' average age of 84 years (CIHI, 2017b). Many of these residents have both physical and cognitive impairment; 62% of residents have a di-

Correspondence: Susan E. Slaughter, Edmonton Clinic Health Academy11405 - 87 Ave, Edmonton Alberta, T6G1C9, CANADA.
e-mail: susan.slaughter@ualberta.ca

Authors: [1] University of Alberta, Faculty of Nursing, [2] University of Alberta, Faculty of Rehabilitation Medicine, [3] University of Alberta, Faculty of Medicine and Dentistry

Received: 8 October 2018 | *Accepted:* 17 November 2018 | *Published Online:* 18 November 2018

National Association of Social and Applied Gerontology

agnosis of dementia and 34% are dependent or totally dependent in their activities of daily living (CIHI, 2017b). Given the complex medical and chronic conditions in this population, maintaining physical capacity is key to mitigating the strain on the health system (Fries et al., 1994).

In 2016, only 34% of residents in Canadian continuing care received physical therapy, 14% received recreational therapy while only 5% received occupational therapy (CIHI, 2017b). In Alberta, only 21% of residents received physical therapy, 31% received recreational therapy and 19% received occupational therapy (CIHI, 2017b). Physical therapists and occupational therapists are not employed on site in Albertan supportive living settings, and physical therapists or occupational therapists make up only 0.7% of the staffing total for long-term care homes (CIHI, 2013). In contrast, 51% of the staffing total in long-term care is unregulated healthcare professionals such as healthcare aides (HCAs) (CIHI, 2013). Given the limited capacity of allied health professionals such as physical and occupational therapists, and the large numbers of continuing care residents not receiving therapeutic services, developing mobility interventions that can be implemented by other staff in continuing care settings is a promising mechanism to improve the functional abilities of frail continuing care residents. HCAs, who provide direct care, spend more time with residents in continuing care settings than any other healthcare professional (Estabrooks, Squires, Carleton, Cummings, & Norton, 2015) and are therefore uniquely situated to support the functional independence and mobility of residents.

Although moderate-to-vigorous levels of physical activity is typically recommended for older adults (PHAC, 2012), low levels of physical activity have been shown to improve functional abilities in older adults (Roberts, Phillips, Cooper, Gray, & Allan, 2017). Even for frail older adults, physical activity has been demonstrated to improve balance and performance of activities of daily living compared to usual care (Chou, Hwang, & Wu, 2012). The sit-to-stand activity, where older adults repeatedly stand up and sit down from a chair, has been shown to slow functional decline and improve mobility in frail long-term care residents with dementia (Slaughter et al., 2015). This activity, implemented by HCAs, is a practical intervention that requires minimal additional training, no additional equipment and is low cost to implement. It is not known if the benefits of the sit-to-stand activity on resident mobility are also seen in older adults without dementia or in other forms of continuing care such as supportive living. This study examined the effect of the sit-to-stand activity delivered by HCAs on mobility outcomes, specifically the ability to transfer, of long-term care and supportive living residents with and without dementia.

Methods

This study was conducted as part of a Hybrid Type III cluster randomized controlled trial (Blinded), which evaluated the effect of varying frequencies and intensities of reminder implementation strategies while also evaluating the effect of the sit-to-stand activity on continuing care resident outcomes (Blinded). This report focuses on the mobility outcomes of continuing care residents.

Recruitment

Fifteen supportive living facilities and 8 long-term care homes from BLINDED were recruited for participation in the Sustaining Transfers through Affordable Research Translation (START) trial. All facilities agreed to introduce the sit-to-stand activity as part of expected care practice for HCAs. Eligible residents were over the age of 65 years at randomization, were medically stable, were able to stand up from a chair, and resided on a participating unit. Additionally, for residents in supportive living facilities, they were only eligible to participate if they had been assessed by a case manager as requiring a minimum level of care assistance established through admission guidelines (AHS, 2010). Recruitment of residents was ongoing throughout the trial to ensure sufficient participants. Unit managers, case managers or delegates approached eligible residents or their authorized representatives used a script to request permission to provide their contact information to the research team. Unit managers, case managers or delegates confirmed the cognitive status of residents. A research assistant then fol-

lowed up with each resident or representative to explain the study in more detail and obtain written informed consent. Assent of residents with cognitive impairment was assessed by their willingness to complete the outcome measures at the beginning and end of the trial. Given the duration of the trial, decision-making capacity was re-confirmed with unit managers, case managers or their delegates prior to the second data-collection point for all residents who started without a previous diagnosis of dementia, to verify that they were still able to consent to collection of endpoint measures. Three residents had been subsequently diagnosed with dementia; consent forms from their authorized decision makers were sought to gather endpoint measures. Two consented while the third declined. Ethics approval was received from the Health Research Ethics Board at the BLINDED university.

There were slightly more were female participants with dementia (69.6%, n = 133) compared to females without dementia (61.0%, n = 64, p = .08). Table-1 includes the age characteristics of resident participants. Those with dementia were slightly older (M = 84.5 years, SD = 7.5, n = 191) compared to participants without dementia (M = 82.70 years, SD = 8.32, n = 105, p = .06).

Mobility training

Full-time, part-time and casual HCAs at all 23 facilities attended 20-minute training sessions on the sit-to-stand activity. Three hundred, sixty-one training sessions were attended by 582 dayshifts and 448 evening shift HCA staff. The 15-minute training sessions, conducted by START study educators, used adult learning principles and interactive techniques to introduce the HCA staff to the sit-to-stand activity including discussing resident safety, discussing the benefits of maintaining mobility in old age, describing how to document the new activity on documentation flowsheets, and problem-solving anticipated challenges. HCAs were asked to complete the sit-to-stand activity with participating residents twice during dayshift and twice during the evening shift, a total of 4 occasions per day.

Measures

HCAs were trained to record completion of the sit-to-stand activity on monthly documentation flowsheets that were integrated into the residents' health record. HCAs would record the number of repetitions of the sit-to-stand activity completed by each resident on each occasion of the activity. A target number, based on the resident's assessed capacity at baseline, was included on each flowsheet for guidance. If a resident refused to complete the activity, the HCA would note the refusal. If a resident was unavailable, due to hospitalization or absence from the site for other reasons, the HCA would note the resident was unavailable. Flowsheets were collected monthly from each site. Resident mobility was measured at two-time points: at baseline, when residents were recruited

Table-1. Resident Characteristics

	Dementia Diagnosis (N = 191)		No Dementia (N=105)	
	Mean (*SD*)		Mean (*SD*)	
Variable	Time 1	Time 2	Time 1	Time 2
Age	84.46 (7.51)	-	82.70 (8.32)	-
Time to 1st STS	5.92 (4.48)	4.90 (3.82)	4.96 (3.58)	4.16 (3.48)
STS in 30 Seconds	5.33 (3.06)	5.20 (3.24)	5.82 (3.15)	6.55 (3.55)
Exposure				
Days between first and last outcome measure	331.5 (162.9)		314 (172.5)	
Intensity				
Repetitions standardized against residents baseline abilities (range 0- ∞)	1.73 (1.47)		1.67 (1.86)	

Note: *SD* = Standard deviation, STS = Sit-to-stand

into the trial, and at the end of the trial. As residents were recruited throughout the trial, the duration between the first and last point varied by the resident. Research assistants measured resident mobility using the 30-second sit-to-stand test (Jones, Rikli, & Beam, 1999; McCarthy, Horvat, Holtsberg, & Wisenbaker, 2004) and the time to complete one sit-to-stand test (Bohannon, 1995). At baseline, research assistants abstracted demographic information from the residents' health record including; age, sex and presence or absence of a dementia diagnosis.

Predictor variables

Residents began and completed their participation in the study at different times; therefore, the dates for the first and last sit-to-stand were individualized as the start and end date for the participation of each resident. Given the residents' varied number of occasions and capacity to repeat the sit-to-stand, the daily flowsheet data were converted into two standardized measures that highlight different elements in the sit-to-stand activities: (1) The variable Exposure to the sit-to-stand activity was calculated for each resident as the number of days between their first and last mobility measurement. (2) The variable Intensity was computed for each resident based on the number of repetitions they completed during their first sit-to-stand test. The repetitions completed on each occasion were thus standardized against the resident's first sit-to-stand test so that a resident who has demonstrated the capability to do more repetitions would need to do more at each occasion to achieve higher intensity.

Outcome variables

The primary purpose of this study was to improve resident mobility. Mobility outcomes were measured using the time for the first sit-to-stand and the number of sit-to-stands completed in 30 seconds. A resident was considered to have gained time if their time for the first sit-to-stand score was two or more seconds slower during the final assessment compared to their baseline, suggesting worsening mobility. A resident was considered to have lost repetitions if their number of sit-to-stands in thirty seconds score was at least two repetitions fewer at their final assessment, compared to their baseline, suggesting worsening mobility.

Analysis

Residents were grouped into two cohorts based on the presence or absence of a dementia diagnosis. Baseline characteristics of the residents were summarized as means and standard deviations (SDs), or counts and percentages as appropriate. Residents with dementia were compared to residents without dementia first by comparing both their mean time for the first sit-to-stand and number of sit-to-stand repetitions completed in 30 seconds.

To compare the levels of exposures and intensity in relation to the two mobility outcomes, the change in the time for the first sit-to-stand was graphically explored through two true positive rate receiver operating characteristic (ROC) curves. These curves allow the identification of an approximate threshold at which the resident cohort achieved, for example at least a 75% success rate in maintaining or improving function cohort achieved, for example at least a 75% success rate in maintaining or improving function.

In order to examine the association between the daily sit-to-stand activity and the sit-to-stand test performance, a series of logistic regression models was created controlling for age, sex, dementia status, and type and size of facility to examine the effects of the derived variables on the likelihood of losing function between the baseline and final outcome measurement. All possible subsets variable selection was used to identify the most relevant covariates of each. Results are reported using adjusted odds ratios (OR). All analyses were completed in R version 3.4.3 (Vienna Austria).

Results

Of the 344 patients who participated in the BLINDED trial, those with both a baseline and final mobility measure were included in the analyses (n = 296). Median exposure (days between baseline and final outcome measurement) was 378 days (Interquartile range = 123-481 days, min = 21 days, max = 511 days). Across all residents, mean time to complete the first sit-to-stand at baseline was 5.58 seconds (SD = 4.20) and the final mean time was 4.63 seconds (SD = 3.71), demonstrating a small improvement in average first sit-to-stand ($p < .001$). Across all residents, mean number of sit-to-stands completed at baseline was 5.50 sit-to-stands (SD = 3.06) and the final test was 5.68 sit-to-stands (SD = 3.41).

The figures show the ROC curves for the outcome of maintaining or improving mobility as measured by time for the first sit-to-stand. Figure-1 suggests that residents who were able to do at least 2.5 times their initial number of repetitions of the sit-to-stand maneuver per day with HCAs had an 85% probability of being successful in preserving or increasing mobility as measured by the research assistants using the time for the first sit-to-stand measurement.

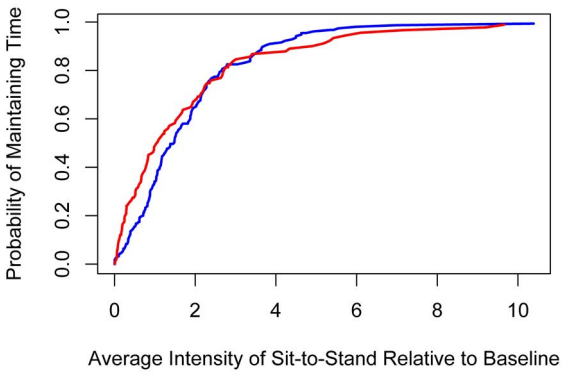

Figure-1. Maintaining time to first sit-to-stand dementia (blue) vs not (red) by intensity

Figure-2 suggests that residents who completed the activity for less than 100 days were only 20% likely to preserve or improve mobility. In contrast, those who completed the activity for more than 400 days, had a 60% probability of being successful in preserving or increasing mobility as measured by the time for the first sit-to-stand measurement.

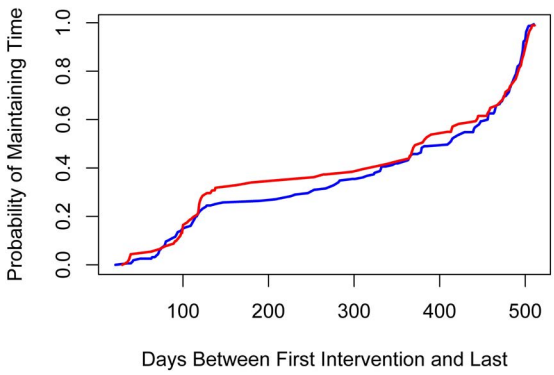

Figure-2. Maintaining time to first sit-to-stand dementia (blue) vs not (red) by exposure

A series of multivariable logistic models was examined which demonstrated the components of the intervention statistically controlled by age, sex and dementia status. Residents with dementia were 1.72 times more likely (95% CI: 0.88-3.34, p = .12) to gain at least two seconds from baseline in their time for the first sit-to-stand compared to those without dementia, representing a slower chair-stand time and thus loss of mobility Intensity, defined previously as the number of sit-to-stand repetitions completed relative to the residents baseline ability, was associated with a ~35% reduction (adjusted OR = 0.64; 95% CI: 0.45-0.91, p = .01) in the risk of gaining time. Thus, the more intense a resident completed the sit-to-stand activity relative to their baseline score, the more a resident was protected against risk of slower completion of the test at the end of the study. Similarly, residents in a long-term care facility were

Table-2. Logistic Regression Models

Outcome: Lost Time	Adjusted Odds Ratio	95% CI	p
Dementia	1.72	0.88-3.34	.12
Intensity	0.84	0.67-1.07	.17
Supportive Living	0.48	0.26-0.88	.02
Outcome: Lost Repetitions	Adjusted Odds Ratio	95% CI	p
Dementia	1.91	(0.74-4.94)	.12
Intensity	0.64	(0.45-0.91)	.01
Supportive Living	1.65	(0.77-3.58)	.21

Note-1: All models adjusted for age and sex
Note-2: CI = Confidence interval

approximately twice as likely as their supportive living counterparts to gain at least 2 seconds from their baseline sit-to-stand time (adjusted OR = 2.08; 95% CI: 1.14-3.84, p = .02). Dementia displayed trend evidence of being associated with a likelihood of losing time and repetitions (p = .12 for both).

Discussion

The sit-to-stand activity is a simple, feasible intervention designed to improve mobility and function of frail older adults. This study built on previous work (Slaughter et al., 2015) exploring the impact of the sit-to-stand activity on mobility. The overall change in mobility scores from baseline was examined, as well as the impact of the duration of exposure and intensity on the likelihood of losing mobility over time. Consistent results were demonstrated from the previous trial, with benefits of the sit-to-stand activity demonstrated among both residents with and without dementia. Increases in the intensity of a resident's sit-to-stand repetitions, relative to their baseline ability, was associated with a reduced risk of losing time in the mobility test, with most benefit observed between 2 and 3 times the baseline repetitions.

Research demonstrating the benefits of physical activity for older adults is increasing. Reviews have identified activity as essential to healthy aging among older adults (Bauman, Merom, Bull, Buchner, & Singh, 2016). More specifically, benefits of activity interventions targeted at older adults considered pre-frail have been documented, including reducing falls and improving mobility (de Labra, Guimaraes-Pinheiro, Maseda, Lorenzo, & Millan-Calenti, 2015). Many participants in this study would be considered pre-frail, as residents in continuing care settings (Fried et al., 2001; Carpenter, Hastie, Morris, Fries, & Ankri, 2006; Slaughter, Eliasziw, Morgan, & Drummond, 2010) and the demonstrated benefits of the sit-to-stand in reducing lost mobility add to the growing literature for this group.

This study found no significant difference between odds of lost time or odds of lost repetitions of the sit-to-stand activity between those with dementia and those without dementia, although the odds ratio trends suggested that residents with dementia were more likely to worsen. The ROC curves also demonstrated similar effects between those with and without dementia. Although the physical decline is an expected outcome of dementia (Auyeung et al., 2008) it is also an expected outcome of transition to and residence in a continuing care facility (Levy et al., 2016), which may suggest why non-significant differences were found.

Residents completing the sit-to-stand activity with high intensity were less likely to lose repetitions in the mobility test compared to those completing the activity with low intensity. Completing more repetitions of the sit-to-stand activity within a single occasion may have been more physically demanding for residents and resulted in improved mobility. This is consistent with research on strength training in older adults. For example, in their meta-analysis of resistance training in older adults, Steib, Schoene, and Pfeifer (2010) found a dose-response relationship between training intensity and maximal muscle strength, with high intensities producing the largest benefits for older adults. These results are echoed in other systematic reviews (Liu & Latham, 2011; Patterson, Jones & Rice, 2007) which have found that higher intensity strength exercise among older adults improves functional ability, such as standing up from a chair, in addition to muscle strength.

Given the limited resources available for therapeutic services, simple functional activities like the sit-to-stand activity that can be completed by unregulated care staff such as HCAs are ideal opportunities to support the mobility of residents in continuing care environments. Our research team has reported the acceptability and feasibility of the sit-to-stand activity elsewhere (Kagwa, Bostrom, Ickert, & Slaughter, 2017). In brief, HCA staff are generally accepting of the activity if appropriate supports are in place, for example, leadership commitment, and if residents are willing and interested in participating (Kagwa et al., 2017). Time limitations and workload challenges were common barriers to completing the sit-to-stand activity, but HCA staff demonstrated creativity in developing strategies to support the integration of the sit-to-stand activity into daily care practice (Kagwa et al., 2017).

Limitations

This study has some limitations. Conducting mobility assessments with older adults with cognitive impairment can be challenging. These participants can have difficulty following instructions or repeating the chair-stand test for a full 30-seconds, leading to measurement error. Both the time to 1st sit-to-stand and the total number of sit-to-stands completed in 30-seconds were included to reduce reliance on a single measure that required residents' sustained focus. Reliance on HCAs' documentation of completing the sit-to-stand activity with residents on monthly documentation flowsheets is a limitation. To optimize adoption of the activity by the HCAs and to mitigate the risk of inaccurate documentation, informal and formal information sessions with HCAs were conducted during the first four months of the study (BLINDED).

Conclusion

The sit-to-stand activity is a simple, feasible mobility intervention that can be implemented by usual care staff in continuing care facilities to support the mobility of frail older adults. Both residents with and without dementia can benefit from this activity, which reduces their likelihood of losing mobility over time.

References

AHS (Alberta Health Services) (2010). *Admission guidelines for publically funded continuing care living options*. Retrieved from https://www.albertahealthservices.ca/assets/info/seniors/if-sen-living-option-guidelines.pdf

Auyeung, T., Kwok T., Lee, J., Leung, P., Leung, J., & Woo, J. (2008). Functional decline in cognitive impairment: The relationship between physical and cognitive function. *Neuroepidemiology, 31*, 167-173. [Crossref]

Bauman, A., Merom, D., Bull, R., Buchner, D., & Singh, F. (2016). Updating the evidence for physical activity: Summative reviews of the epidemiological evidence, prevalence, and interventions to promote "Active Aging". *The Gerontologist, 56*(S2), S268-S280.[Crossref]

Bohannon R. (1995) Sit-to-stand test for measuring performance of lower extremity muscles. *Perceptual and Motor Skills, 80*,163-166. [Crossref]

Carpenter, G. I., Hastie, C. L., Morris, J. N., Fries, B. E., & Ankri, J. (2006). Measuring change in activities of daily living in nursing home residents with moderate to severe cognitive impairment. *BMC Geriatrics, 6, 7*. [Crossref]

CIHI (Canadian Institute of Health Information) (2017a). *Seniors in transition: Exploring pathways across the care continuum*. Ottawa, ON.

CIHI (Canadian Institute of Health Information) (2017b). *CCRS Profile of Residents in Continuing Care Facilities 2016-2017*. Retrieved from https://www.cihi.ca/en/quick-stats

CIHI (Canadian Institute of Health Information) (2013). *Residential Long-Term Care Financial Data Tables 2013*. Retrieved from https://www.cihi.ca/en/quick-stats

Chou, C., Hwang, C., & Wu, Y. (2012). Effect of exercise on physical function, daily living activities, and quality of life in the frail older adults: A meta-analysis. *Archives of Physical Medicine and Rehabilitation, 93, 237*-244. [Crossref]

de Labra, C., Guimaraes-Pinheiro, C., Maseda, A., Lorenzo, T., & Millan-Calenti, J. (2015). Effects of physical exercise interventions in frail older adults: A systematic review of randomized controlled trials. *BMC Geriatrics, 15,* 154. [Crossref]

Douglas, N. F., Campbell, W. N., & Hinckley, J. J. (2015). Implementation science: Buzzword or game changer? *Journal of Speech, Language, and Hearing Research, 58,* S1827-S1836. [Crossref]

Estabrooks, C., Squires, J., Carleton, H., Cummings, G., & Norton, P. (2015). Who is looking after Mom and Dad? Unregulated workers in Canadian long-term care homes. *Canadian Journal on Aging, 34*(1), 47-59. [Crossref]

Fried, L., Tangen, C., Walston, J., Newman, A., Hirsch, C., Gottdiener, J., … McBurnie, M. A. (2001). Frailty in older adults: Evidence for a phenotype. *Journal of Gerontology: Medical Sciences, 56A*(3), M146-M156. [Crossref]

Fries, B., Schneider, D., Foley, W., Gavazzi, M., Burke, R., & Cornelius, E. (1994). Refining a case-mix measure for nursing homes: Resource utilization groups (RUG-III). *Medical Care, 32*(7), 668-685.

Jones, C. J., Rikli, R. E., & Beam, W. C. (1999). A 30s chair-stand test as a measure of lower body strength in community-residing older adults. *Research Quarterly for Exercise and Sport, 70*, 113-117. [Crossref]

Kagwa, S., Bostrom, A-M., Ickert, C., & Slaughter, S. (2017). Optimising mobility through the sit-to-stand activity for older people living in residential care facilities: A qualitative interview study of healthcare aide experiences. *International Journal of Older People Nursing, 13*, e12169. [Crossref]

Levy, C. R., Zargoush, M., Williams, A. E., Williams, A. R., Giang, P., Wojtusiak, J., … Alemi, F. (2016). Sequence of functional loss and recovery in nursing homes. *Gerontologist, 56*(1), 52-61. [Crossref]

Liu, C.-J., & Latham, N. (2011). Can progressive resistance strength training reduce physical disability in older adults? A meta-analysis study. *Disability and Rehabilitation, 33*(2), 87-97. [Crossref]

McCarthy, E. K., Horvat, M. A., Holtsberg, P. A., & Wisenbaker, J. M. (2004). Repeated chair stands as a measure of lower limb strength in sexagenarian women. *Journal of Gerontology: Medical Sciences, 59*A, 1207-1212. [Crossref]

Paterson, D. H., Jones, G. R., & Rice, C. L. (2007). Ageing and physical activity: Evidence to develop exercise recommendations for older adults. *Canadian Journal of Public Health, 98*(Suppl. 2), S69-S108. [Crossref]

PHAC (Public Health Agency of Canada) (2012). Physical activity tips for older adults (65 years and older). Retrieved from https://www. canada.ca/en/public-health/services/health-promotion/healthy-living/physical-activity/physical-activity-tips-older-adults-65-years-older.html

Roberts, C. E., Phillips, L. H., Cooper, C. L., Gray, S., & Allan, J. L. (2017). Effect of different types of physical activity on activities of daily living in older adults: Systematic review and meta-analysis. *Journal of Aging and Physical Activity, 25,* 653-670. [Crossref]

Slaughter, S. E., Eliasziw, M., Morgan, D., & Drummond, N. (2010). Incidence and predictors of excess disability in walking among nursing home residents with middle-stage dementia: A prospective cohort study. *International Psychogeriatrics, 23*(1), 54-64. [Crossref]

Slaughter, S. E., Estabrooks, C. A., Jones, C. A., Wagg, A. S., & Eliasziw, M. (2013). Sustaining Transfers through Affordable Research Translation (START): study protocol to assess knowledge translation interventions in continuing care settings. *Trials, 14,* 355. [Crossref]

Slaughter, S. E., Wagg, A., Jones, A., Schopflocher, D., Ickert, C., Bampton, E., … Estabrooks, C. (2015). Mobility of Vulnerable Elders (MOVE) study: Effect of the sit-to-stand activity on mobility, function and quality of life. *Journal of the American Medical Directors Association, 16*(2), 138-143. [Crossref]

Statistics Canada (2013). Population Projections for Canada (2013 to 2063), Provinces and Territories (2013) to 2038. Retrieved from http://www.statcan.gc.ca/pub/91-520-x/91-520-x2014001-eng.pdf

Steib, S., Schoene, D., & Pfeifer, K. (2010). Dose-response relationship of resistance training in older adults: A meta-analysis. *Medicine and Science in Sport and Exercise, 42*(5), 902-914. [Crossref]

Tworek, K., Ickert, C., Bakal, J., Eliasziw, M., Wagg, A. S., Jones, C. A., & Slaughter, S. (in press). Examining the impact of knowledge translation interventions on uptake of evidence-base practices by care aides in continuing care. *Worldviews on Evidence-Based Nursing*.

JOURNAL of AGING and LONG-TERM CARE
www.agingandlongtermcare.com

ISSN 2619-9017 | E-ISSN 2618-6535

OTHER

2018, 1(2), 73-87
doi: 10.5505/jaltc.2018.02886

The Implementation of an Evidence-Based Practice Falls Prevention Program in Long-Term Care

Candice R. P. Matthews

Abstract

Falls in older people can cause poor quality of life and even death in residential care facilities which has raised the question if an evidence-based practice falls prevention program would have an impact on the incidence of falls and improvement in quality measures in 8 weeks using a self-efficacy scale. An eight-week pilot study was conducted on a long-term care unit in a skilled/long-term care facility to determine if the confidence and knowledge levels of nursing staff would improve after evidence-based practice fall prevention education. Data was collected using a self-efficacy scale adopted from the IOWA model. Mean confidence levels were determined pre and post survey based on the 17-item questionnaire of a participant sample of 4. Results suggested that there is significant statistical correlation between the increase in confidence and knowledge of evidence-based fall prevention and the educational intervention, but no correlation to the decrease in fall rate due to changes in decisions of recommended fall prevention interventions. It is argued that the ability to utilize recommended interventions by nursing staff would have allowed for evidence-based practice interventions to be implemented and would have had an impact on the rate of falls.

Keywords: Falls prevention, evidence-based practice, interventions, pilot project, long-term care, older people

Key Practitioners Message

- Falls among older people can be life-threating encounters.
- Healthcare workers in skilled and long-term care facilities can reduce these life threating encounters by fall prevention programs that assist to improve the quality of care and quality of life of the older people they serve.
- This paper will identify the significance of evidence-based practice measures as it relates to falls prevention, describe the target population and proposal for a falls prevention program for a skilled/long-term care facility, theoretical framework associated with the basis of the falls prevention program, synthesis of literature, practice recommendations, project setting, the mission, vision, and objectives of the project, the project description, project evaluation and data analysis implications for nursing and healthcare, and plans for dissemination.

The Significance of the Practice Problem

Falls in long-term/skilled care facilities can lead to major injuries and poor quality of life. Falls can also have psychological effects on older people due to having a fear of falling (Vlaeyen et al., 2015). Falls with injuries can serious consequences such as fracture which cause death in 31% of older people in nursing facilities and about 12% have an additional fracture a year later after the initial fracture that resulted from the fall (Vlaeyen et al., 2015). Older people who suffer from fear of falling and falls suffer from poor quality of life living in fear of having a fall. Having a fall in the nursing facility associated with transportation to and from the hospital, surgical repairs of a fracture and possible

Correspondence: Candice R P Matthews, Department of Staff And Professional Development, Montefiore Nursing Home, Beachwood, Ohio, USA. e-mail: ambitionsucceeds1@gmail.com

Author: [1] Department of Staff And Professional Development, Montefiore Nursing Home, Beachwood, Ohio, USA.

Received: 23 January 2018 | *Accepted:* 8 June 2018 | *Published Online:* 26 June 2018

lifelong mobility issues can be very costly to the facility as well as to the individuals' life. Falls in a nursing facility can also affect the quality of care and rating that a facility receives on a regional and national level. The quality care rating for a nursing facility is important because the ratings depict the type of care that the facility is providing to the population it serves. The higher the rating, the more likely that other healthcare entities will refer patients to that facility for care rather it be skilled or on a more permanent basis such as long-term care. When residents/patients fall in nursing facilities, this has a negative impact on the quality rating of the facility. Decreases in quality ratings can mean that the facility's ability to recruit new residents/patients can be difficult and the admissions to the facility can decrease. If this happens, then the total incoming revenue to the facility can be at a standstill or even decrease. If a skilled patient falls in the nursing facility and obtains an injury and goes back to the hospital, that individual may not return back to that same facility where the fall occurred due to a lack of quality care.

Falls in nursing facilities also pose a great risk for litigating circumstances. Falls account for 26% of nursing home litigating claims (Studdert, Spittal, Mello, O'Malley, & Stevenson, 2011). Nursing facilities who have many deficiencies are more likely to be sued often (Studdert, Spittal, Mello, O'Malley, & Stevenson, 2011). Factors that are associated with falls and litigating circumstances include fractures that resulted from falls and decreases in hours for nurses' aides (Studdert, Spittal, Mello, O'Malley, & Stevenson, 2011). These circumstances can also cause unexpected surveyor visits from regulating agencies of nursing facility operations and increase the risk of a citation if the facility fails to meet compliance in any regulated area. Falls also create other professional and legal issues such as negligence. Failure to meet the needs of a resident as well as not decreasing the risk that a patient/resident will fall can be viewed as negligence. Quality indicators can reflect negligence on the part of a facility (Studdert, Spittal, Melllo, O'Malley, & Stevenson, 2011). If the quality indicators for falls are poor as evidence by an increase in falls in a nursing facility, there may be unintentional and/or intentional negligence happening in the facility.

There is also a professional responsibility for nursing staff to do no harm to the ones they care for. This is an ethical responsibility of staff to maintain the way they care for others as to cause not harm or put the ones they care for in a harmful situation. Furthermore, falls in nursing facilities also cause stress on family members of the individual who fell. Family may have to visit other healthcare facilities if the individual had an injury related to a fall or if the individual had died as a result of a fall.

PICOT Question

The PICOT question identified for this project is: *"For nursing staff in a long-term care setting, how will the implementation of an evidence-based practice falls prevention program influence quality measures and the incidence of falls among residents in 8 weeks?"*

The populations for the falls prevention project were nursing staff in a long-term/skilled nursing facility which includes registered nurses, licensed practical nurses, and state tested nursing assistants. The current population in the practice setting is made up of an estimated 40 full-time direct care nurses (both registered nurses and licensed practical nurses) and 75 full-time state tested nursing assistants. The sample amount for the current study includes only a portion of that population for a pilot study. The registered nurses and licensed practical nurses are individuals who complete rigorous training in the profession of nursing and are registered (RN) and/or licensed (LPN) to practice under the guideline of the state in which they have applied and completed testing at the selected states board of nursing. These individuals are responsible for data collection and observations of care, as well as the implementation of care and interventions related to the population served. The state testing nursing assistants are individuals who go through training that involves the ability to assist a patient or resident with activities of daily living that includes bathing, dressing, toileting, eating, and mobility as well as other care services and skills such as taking vital signs. These individuals then are tested and receive licensure as a state

tested nursing assistant in the state in which they have applied upon successful passing of the test. The curriculum for such is based on state guidelines, law, and requirements.

The intervention that was utilized in the selected facility was an evidence-based practice fall intervention program. This fall intervention program focused on aspects of when to perform falls risk assessments, utilization of unique patient/resident identifiers in the patient/residents' room, identifiers that can be placed on the patient/resident, frequent rounding, and resident/patient needs anticipation. The performance of falls risk assessments was intended be more than just upon admission and if a fall has occurred. Many other factors cause falls such as medications and illnesses. Therefore, it was essential to educate the utilization of the falls risk assessment on many other occasions. There were no other current resident/patient identifiers for falls risk individuals other than what is in the chart. An identifier is typical a visual notification other than the medical record of identifying someone who is a risk to fall. Therefore, implementation of such was essential to educate staff on utilization for staff that may not have accessibility to a chart at the time. The anticipation of resident needs was essential in the prevention of falls due to anticipating those needs and meeting those needs to decrease risks to falling by way of unmet needs.

The current program that the facility had implemented is a falls intervention program along with a no pass zone policy. The falls intervention program in place only conducted falls risk assessments upon admission and if a fall occurs. Interventions were then put in place upon scoring of the initial falls assessment as well as if an additional assessment was conducted as a result of the fall. The no pass zone is a fairly new policy that was put in place as a result of a recent surveyor visit and not as a result of frequent falls but has been utilized to assist in decreasing falls in the facility. The no pass zone policy that the facility has in place was intended for all staff regardless of discipline to answer a call light if they are in an area where a call light is ringing. If the need can be met, the staff member was to provide assistance. If the need is to be met by another staff member, the staff who responded to the call light is to leave the light on and notify the staff member who is able to provide such assistance. There had not been any in-facility data to determine if this new policy had been effective or not.

The outcome of the project was to increase confidence levels of nursing staff, decrease falls and improve in quality measures. The interventions that were put into place aimed to decrease the number of falls by more frequent assessments of falls risks given risk factors that may present with a possibility that one may fall such as a change in a cardiac medication. As a result, frequent falls risk assessments should trigger interventions to care plans that will improve care being provided when a risk to fall is suspected and the interventions to decrease such risks to be implemented in the patients/residents care plan.

The timing for this project was 8 weeks. The study was a pilot study in which meant that the study was conducted on one unit in the facility to determine if any improvements in care and decrease in falls were obtained. This study was also be feasible due to the facility's support and desire to increase quality care, improvements in falls quality scores, and over improvement in the quality of life for the residents/patients that are served.

Theoretical Framework

The change model that was appropriate for this project was Lewin's theory of change. This social theory was selected as a framework for this project because each stage of the theory represents how changes affect organizations' barriers to changes and success to implementation (Sutherland, 2013). Oppositions to change in this theory are considered to be static forces as they are forces that work against the change (Sutherland, 2013). The factors that drive the change considered to be driving forces which assist to promote and move the change initiative along (Sutherland, 2013). The three stages to Lewin's theory are unfreezing, moving, and refreezing. The unfreezing stage will allow the driving forces to become strong while decreasing the effects of the static forces. The mo-

ving stage will allow for the change to take place. The refreezing stage will allow the changes made to be evaluated for the effectiveness on practice. As a result of this theory utilization, aspects of the Plan –Do-Study-Act-Cycle was also be implemented since this is a quality improvement project. During the planning phase, the goals of the project were be determined as well as the predictions. The "Do" phase was the actual implementation of the project, the observations of problems and the initiation of data analysis (IHI, 2017). The "study" phase was the completion of data analysis and comparison of data to the hypothesis, and the summation and reflection of the project. The "act" phase entailed determining what changes should be made and plans to make those changes and any plans to test the new recommended changes. This quality improvement model assisted in determining the effectiveness of the project with any recommendations in order to consider additional changes that will need to be made in order to be successful in improving quality of care for falls.

The mission of the project was to continuously use evidence-based practice knowledge and improve falls prevention and risk reduction on an ongoing basis to provide quality care, therefore it will be essential to make a plan for the change, implement or act on the change, and then study it to see the effects the change will have on the population in order to look for continuous improvements in providing quality care. The change that took place was an organizational change; therefore as an organization, it is essential to continually look at processes and way to improve care on a continuous basis.

Synthesis of the Literature

A review of the literature suggests that fall prevention programs help to reduce falls in nursing facilities and help to deliver quality care to the served population. Literature also suggests that staff lack the appropriate evidence-based knowledge to make appropriate falls prevention implementations. Jackson (2016) conducted a study on muti-interventional protocols for falls reduction in long-term care facilities in which it was predicted that interventional protocols would reduce the number of falls. This study proved that there is a significance decrease in the rates of falls if implemented over a 4 month period. The staff members also increased their knowledge of evidence-based practice by twenty percent. This study also supports the proposed falls program for the current facility due to the similar nature of providing staff with knowledge on evidence-based practice to improve quality care. This study also considers the joint responsibility of nursing leaders and staff to foster improvement in the quality of care.

This study correlates to a study conducted by Rojas-Fernandez, Seymour, and Brown (2014) on the use of algorithms to increase the number of fall-related medication changes due to the nature to provide staff will a tool to use to improve quality of care. This study focuses on the pharmacist to use the tool to prompt medication changes, however, this tool can also be utilized to provide nurses with the autonomy to conduct a falls risk assessment and make recommendations to the primary care physician and pharmacist to review and change medications that can cause potential falls if the medication is not medically indicated or if a substitute with less side effects is available. Even though further research may be needed to test the algorithm, algorithms can be used to guide practice thinking to make more appropriate informed decisions about care.

A study conducted by Nitz, Cyarto, Andrews, Fearn, Haines, Haralambous, Hill, Hunt, Lea, Morre, Renehan, & Robinson (2012) on the implementation of an evidence-based falls prevention program in a residential aged care facility proved that evidence-based practice falls prevention programs with specific interventions decrease the number of fallers in such facilities. This study correlates with a study conducted by Jackson (2012) because both studies encompassed interventional methods that were based on evidence-based practice focus and knowledge. The significance of the Nitz and her colleagues (2012) study proved to be relevant by identifying that trends for fewer falls should be sustained and that this should be the goal of evidence-based fall prevention programs in residential aged care facilities.

Urquhart Wilbert (2013) concluded in a study that medications and diagnosis were the cause of many falls. This correlates with Rojas-Fernandez, Seymour, and Brown (2014) in an aspect that the use of algorithms will help to decrease falls related to medications. Since Urquhart Wilbert (2013) came to that conclusion, inferences can be made that will suggest that due to the medications causing many falls, the use of an algorithm as suggested by Rojas-Fernandez, Seymour, and Brown (2014) would be appropriate. These studies support the current evidence-based falls prevention program/project due to the realization of medications and diagnosis as potential factors for falls thus inferring that falls risk assessments should be performed as a result of changes in medications as well as a specific diagnosis that would cause an individual to be at a risk to fall.

Batra, Page, Melchior, Seff, Vieira, and Palme (2013) addresses the psychological affects that falls have on older people in their study conducted on completion of falls prevention programs to decrease falls and fear of falling. Falls can cause psychological fear that the individual may fall again, however, according to Batra and her colleagues (2013) completion of such falls prevention programs can help to decrease attrition and increase benefits of cost and program effectiveness. Therefore, the psychological affects that falls have on older people can be reduced through compliance in a falls prevention program; however, social factors may determine the completion of such a program.

Faraq, Howard, Ferreira, and Sherrington (2015) conducted a study that determined that falls prevention programs should be considered as a cost-effective option that will allow access to a variety of intervention methods. This correlates with the study conducted by Batra and her colleagues (2013) which also determined that fall prevention programs are cost-effective. The relationship between these two studies can infer that fall prevention programs are considered to be cost-effective and the opportunity to utilize a variety of intervention can be considered as ideal. The basis of the interventions should include methods proved to be effective by way of evidence-based practice.

A study conducted by Johansson, Borell, and Jonsson (2014) concluded that falls prevention programs can be utilized as a model for other programs that are focused on being client-centered. The study also revealed that staff is challenged in their professional roles when the interventions are more so client-centered. As a result, a guided approach should be utilized when implementing interventions that are client-centered. This study gives insight to the current project that it may be a challenge for staff to implement some of the interventions such as the additional falls risk assessment based on medications or diagnosis because these are interventions that are centered around what the resident/patient currently has going on at the time of the assessment. This would also increase the amount of falls assessments and interventions that would be put in place for residents/patients and the staff who are responsible for the implementation of such. Therefore, time management and critical thinking abilities would be challenging for the staff. Furthermore, in correlation with Lewin's change model theory, this study revealed that impacts to changes would be made over time, which correlates to the refreezing stage in which staff would have to continue to practice under the new changes and adapt to the change. In return, an inference can be made that the change has impacted practice over time.

According to Hass, Mason, and Haines (2014) guided approaches should be used for goal setting and the implementation of training and follow-up support in regards to goal setting should be utilized to promote behavioral change for falls prevention. The main concept of this study can be inferenced to determine that goals for falls programs should be guided. The guidance of the goals for fall prevention programs correlates to the ideals of using algorithms which can guide critical thinking and interventional approach to individuals at risk to fall. For the purpose of the current project, guidance to goals will be utilized during the implementation phase of the project which includes the educational in-services using evidence-based practice as a guide for the goals of the falls prevention program.

According to Hang, Francis-Coad, Burro, Nobre, and Hill (2016) education and training should be provided in order to implement falls prevention programs. This also correlates the Hass, Mason, and Haines (2014) due to the ideals that the goal setting for falls prevention programs should be guided for purposes of goal setting. Hang, Francis-Coad, Burro, Nobre, and Hill (2016) noted that residential aged care workers have low levels of evidence-based knowledge in regards to falls prevention. Therefore, as a result of the lack of knowledge, goals for such a fall prevention program should be guided as references by Hass, Mason, and Haines (2014).

Education on evidence-based practice falls prevention program can also serve as motivation to staff who lack the knowledge as it can be inferred that it is seen as a sense of empowerment to utilize the newly gained knowledge in practice and provide an improved degree of care amongst those served in a nursing facility.

Furthermore, Heinrich, Rapp, Stuhldreher, Rissman, Becker, and Konid (2013) suggests that the ultimate decision on cost-effectiveness on a falls prevention program is dependent upon the amount that the decision maker is willing to spend on such a program. According to a study conducted by Heinrich and his colleagues (2013) on determining if a multifactorial fall prevention program will be cost effective in a nursing home revealed that there is a cost-effective probability rate of 83%. However, this may be over the time period of a year. This takes into consideration the costs analysis of falls with an injury that lead to fractures, which can be very costly in terms of hospital stays, surgeries, litigations, and even death. Therefore, the amount and time it takes to reveal cost savings may prove to be effective versus the amount that was spent to implement the program. This also correlates with studies conducted by Batra and her colleagues (2013) and Faraq, Howard, Ferreira, and Sherrington (2015) which both came to the inference that fall prevention programs are considered cost-effective, especially when costs associated with one fall are taken into consideration.

Practice Recommendations

Based on a review of literature and recommendations, the practice recommendation was to utilize a falls prevention program to decrease falls. A review of ten studies indicated a common theme that staff in nursing home facilities has a lack of knowledge and ability to assess falls in older people which can result in behaviors that do not reflect falls prevention knowledge. Therefore, this evidence substantiated the need for falls prevention education and evidence-based intervention to decrease falls in long-term/skilled care facilities. The recommendation was to educate and train staff on evidence-based practice related falls prevention as well as use a resident/patient-centered care from a multidisciplinary approach which should serve to be cost-effective. These practice changes included in-service education on falls, situations that would prompt a falls assessment, anticipation of resident/patients' needs and identification of residents/patients' that falls risk.

The in-service education on falls included reasons why an individual would fall as well as situations in which a falls risk assessment should be completed such as cardiac or psychotropic medication changes as well as sudden weakness in mobility and newly acquired acute illnesses. These additional situations would supplement the current practice which conducts falls assessment upon admission, history, and if a new fall had occurred. The in-service also served to educate staff on anticipated needs of residents/patients. This identified that during the times that falls occur the most, and the situations that the fall was based on, determined the need to intervene and provide the anticipated need in order to prevent the fall. Therefore, if the staff member can anticipate what the resident/patient will need, then they provided that service for them to meet that need in order to prevent the fall.

The identification of residents/patients was currently in a computerized medical record system. The recommendation to have physical identifiers was recommended so that staff can immediately prioritize the ability to meet a need if the individual is a high risk for falls. This also assists in alerting non-clinical staff to intervene for a non-medical need such as picking the remote off the floor for a resident/patient to help reduce their risk to fall.

Project Setting

The setting of the falls prevention project took place in a 247-bed skilled nursing and long-term care facility. This is a Jewish facility which takes care of residents and patients on a tertiary level. These residents have co-morbidities and illnesses which prevent them from living in the community on their own and the facility provides all of the care for the resident. The typical resident in this facility is on average 75 to 80 years old with a mix of male and female gender. The mission of this facility was to provide care for the aged in the community. It was originally meant to provide care for the Jewish aging community but then opened later to provide services for all older people in the community. The organizational structure starts with a president of the company, an administrator/ vice president, and assistant administrator. There was also a director of nursing along with nursing administration and administrative staff. Finally, there was direct care and frontline staff. The organizational culture was reactive in the sense that education and changes were made as a result of something that had happened. The intention of this project was to attempt to promote education and interventions that are more proactive as a part of the implementation of this project.

The organizational need was identified as a result of a recent increase in the number of falls and the decrease in quality measures as presented in a quality meeting after review of recent star quality measures on a regional level. The dialogue was conducted by the pilot project manager with the director of nursing and the director of staff development in regards to some of the biggest improvement that can be made to increase star quality rating and falls was on the top of the list. The facility had an intervention policy but did not have a falls prevention program. This was considered the problem trigger.

The stakeholders that were impacted by the change were the residents because it was intended for them to have fewer falls, the staff because they were to manage the falls through implementation, and administrative nursing and administrative staff because they were to report improvements in this area of quality to improve star ratings. The organization was in support of this project because it was intended help to decrease falls and help to improve quality care for residents. The project was intended to assist in improving quality star ratings for the facility. Support for the project was confirmed through dialogue with the director of staff development and director of nursing in terms of how the program can improve the current practice of falls assessments and preventions which can improve the quality of care for the residents.

The strengths, weaknesses, opportunities, and threats to this project had determined the success and outcomes (see Table-1). The internal force which is the project and the strengths that are presented based on literature include; decreases in falls, improvement in quality care, improvement in residents' needs, and increase in staff's knowled-

Table-1: The SWOT (strengths, weaknesses, opportunities, and threats) helped to identify the barriers and strengths associated with the fall prevention program

Internal Forces (Project)	External Forces (Organization or Environment)
Strengths – Decrease in falls incidents – Improvement in quality resident care – Improvement in awareness of resident need and adherence to resident rights – Improvement in staff knowledge of falls risk reduction – Administration approval of the project	Opportunities – Improvement in the quality star rating – Clearer environmental paths for residents – Resident needs met – Improvement in quality care
Weaknesses – Staff compliance – Staff accountability	Threats – Staffing under budge – Staff not coming to work

ge of evidence-based practice. The facility's' support was also a strength. The weaknesses, which are also internal, to this project lie within the target populations' ability to be compliant and accountable to interventions and educational in-services provided as it relates to aspect presented from the project. The opportunities, which are external forces, include; improvements in quality care and star ratings, clearer environmental paths for residents, and improvements in meeting residents' needs. The threats to this project were staffing under budget due to staff terminations and staff calling off for their shifts. This is a threat because the interventions were not executed to the full extent due to the lack of staff available to execute them. The risk of this project was that results may not be seen in the 8-week pilot and the facility may want to discontinue the project. Unintended consequences included that staff may not get breaks as intended if they are operating under budget staffing wise on the units and the intended interventions may not be executed as a result.This practice change must be sustained after completion because if ongoing, it can continually reduce fall risk and rates as evidenced by literature. The dialogue between nursing administration and the project manager was conducted to determine future plans for intervention implementation as recommended during the evidence-based practice educational sessions in order to sustain the practice change. It was imperative that the administrative stakeholders hold direct care staff accountable to continue with the implementation of the program, which was also discussed with nursing administration and project manager.

Project Vision, Mission, and Objectives

The vision of this project is to improve current practice initiatives to reduce falls and risk to fall in order to provide quality care to the population served. The mission statement of this project is to continually implement improvements in current practice by way of gaining evidence-based best practices knowledge and utilizing that knowledge to implement best practice interventions related to falls prevention in order to continually provide quality care. The mission of the organization is to provide care for those aging in the community who can no longer care for themselves. The vision and mission of the project is an extension and elaboration of the basic mission statement of the facility. Providing quality care with the utilization of evidence-based knowledge and practice as it relates to falls with the continuous implementation to evidence-based practice intervention assist to serve the facility's mission by providing care to the aging community. The mission of the project goes to the extent at which care for the aging community is being provided.

At the completion of the 8-week pilot project on falls prevention, it was anticipated that there will be a 10% percent reduction in falls for the pilot unit and a 50% increase in compliance with falls prevention implementation and evidence-based knowledge of staff related to fall prevention. The long-term objective of this falls prevention program was to have an 80% reduction in falls for the facility and an 80% increase in compliance with falls prevention implementation and evidence-based knowledge of staff related to falls prevention within 8months. The potential risk that was anticipated was to have a poor outcome for the project is the risk of the pilot unit being understaffed to fully carry out the project implementation during the 8 weeks. Understaffing can be due to a variety of situations such as calls off terminations or operating under budget. Another risk was that staff may not attend the in-services if they were not mandatory.

Project Description

The change model that was selected for this project was Lewin's theory of change. This model was selected because it facilitated the organizational changes in three phases: unfreezing, moving, and refreezing. Each phase of this model represented the phases of the project that the organization encounters in order to facilitate such a change. The quality improvement model that was selected was the Plan-Do-Study-Act model. This model was selected because it is a model that is focused on improving quality initiatives. This model also is supportive of evidence-based practice and this project

because the phases in each part of the model serve to execute the project through planning, executing interventions, observing the project and making recommendations based on the findings in order to improve practice based on the outcomes and evaluations of the project. The planning phase and unfreezing phase of the project was conducted prior to the start of the implementation. The project was implemented over the course of 8 weeks and was a pilot project on one long-term care unit.

Week-1

During the first week, implementation of the self-efficacy survey was conducted. The self-efficacy survey was adapted from Iowa University and was a survey that measures the self-confidence of nursing staff in relation to evidence-based practice knowledge. This was selected because it was to serve as the pre-questionnaire that determined the amount of evidence-based knowledge that staff had prior to the introduction of the falls prevention program education. This was also the initiation of the moving phase of Lewin's change theory and the "DO" phase of the PDSA quality care model.

Week-2

During the second week, the pre-self efficacy survey continued as well as plans for holding educational sessions was determined. Staff education was initiated as well. Education included reasons for falls risk assessment to include medication changes and acute illnesses, which were beyond the current policy implementations of upon admission and if there is a new fall. This also included education on recommended interventions such as meeting anticipated needs and visible patient identifiers such as a star that will be placed in the residents' room, wheelchair, and/or walker that will represent falls as a reflection of a falling star, as well as placing yellow socks on the residents' feet that are fall risks.

Weeks 3, -4, -5, -6, -7

During weeks 3-7, educational sessions continued for interested participants as well as audits for recommended interventions based off of the evidenced-based practice falls prevention on the unit. The checklist/audit tool (see Table-2) was used for the unit to make sure that falls assessments were conducted for specific situations for residents, if anyone was added as a falls risk as a result of the recommended falls prevention risk assessment education, if the residents had the stars in the room, and if the residents were wearing the yellow socks. These audits were conducted 3 times a week for weeks 3-7.

Table-2: The intervention compliance audit tool checklist*

Resident on Falls prevention program**	Does resident have yellow socks on?	Does resident have star posted in the room and on adaptive mobility equipment?	Date of last fall's risk assessment and indicator for falls risk assessment?	Comments
A1	Y	Y	9/2016 admission	
B2	N	Y	8/2016 admission 2/10/17 medication change	RR1, placed yellow socks on B2
C3	N	Y	1/1/2017 admission	
D4	Y	Y		
E5	Y	Y		
F6	Y	Y		
G7	N	Y		

Note-1: * = This is the intervention compliance audit tool checklist. The values above are only examples to depict how the audit tool/checklist was filled out when conducting the audits.
Note-2: ** = Identified by a letter and number, i.e. A1: If a new resident, date added must be under identification.

Week-8

During Week 8 the distribution of the post-survey to the unit as well as the evaluation of the study took place. The number of falls was tallied and compared to the previous 2 months of falls to determine if a reduction was identified. This was also a part of the "study" phase of the quality model, which served to observe what had happened during the study and recommendation. The results of the study were shared with the participants of the study as well as nursing administration, and the "act" phase of the quality model was implemented. The facility was given the opportunity to make a determination if they were going to adopt the evidence-based practice falls prevention program based on recommendations or if they were going to reject it. This was also where the organization entered into the refreezing stage of Lewin's change theory in which they were in the process of determining to adopt the program and accept it as the new way of practice, or reject it, which means that the series of the change theory would then start over and the quality model would also start over with a plan to implement additional interventions based on what did not work. The facility had decided to make a decision on sustainability and did not make a decision.

Barriers

Barriers encountered during the project were a small number of participants who completed all three phases of the project due to challenges with staffing on the unit. There were participants who completed one or two portions of the project but did not complete all three. Other barriers encountered were small numbers of participants who came to the educational sessions due to challenges with workload during patient care. Educational sessions were offered around times that were not as busy for staff; however, attendance was still low. Additional barriers were that since this was voluntary participation, staff did not express much interest to come to the educational sessions even though they may have participated in the pre-survey due to challenged staffing which may have deterred their desire to participate fully in the study.

Resources and Financial Support

The resources that were needed for this project was nursing staff on the specified unit which includes; 13 state tested nursing assistants, and 7 nurses (a combination of registered nurses and licensed practical nurses). Materials needed for this project included colored paper, lamination sheets, scissors, tape, copy paper, and yellow socks. The needed financial support were designated staffing ratios and support for the ordering of yellow socks for falls program residents as well as supplies needed to make the icons for individuals who were on the falls program. The budget for staff varied due to differing pay rates that were not disclosed, so the expenses for staff were estimated. However, the costs for supplies were because some of the supplies were already at the facility. As a result of the expenses and revenue, the cost of this project was estimated to be about 15% of the revenue for the unit (see Table-3). This estimate was determined as reimbursement rates vary due to MDS scoring and reimbursement rates for federally funded programs as well as private pay residents. The cost and expense were just for one unit.The role that this author took in this project was the project manager in which this author conducted the pre and post surveys, the initial education, creation of identifiers, the unit audits as well as dissemination of results to the participants and planning. This author led this project with the assistance of the facility staff development department, in which they served as a consult for setting up educational sessions, helping to present education and plans for policy change. The ordering of the socks was referred to the central supply department. This author collaborated with the selected units' nurse manager in order to deliver education to as many staff as possible as well as serve as a consultant to the nurse manager. This author attended many quality improvement meetings in which aspects of the project was shared each week in which this author served as a consultant for many quality projects that relate to falls in different aspects such as assisting with the new implementation of an electronic medical record and appropriate assessment and documentation templates for that system.

Project Evaluation Results

The facility did not require an internal review board process to take place, but they were in full support of the project. However, Chamberlain College of Nursing did require an IRB process to take place which was completed prior to implementation. The IRB process identified human subjects as test subjects in regards to the protection of ethical considerations as well as medical information. The intervention utilized in this project served to promote improvements in quality care and decrease the likelihood that falls should occur. The participants selected were unit based and were on one of the four long-term care units in the facility. Inclusion criteria were nursing staff that included all registered nurses, licensed practical nurses, state tested nursing assistants, and nurse managers who were on the selected unit and who were regular staff (full-time and part-time). The exclusion criteria were any nursing staffs that were not directly employed by the facility (agency) and who were not regularly scheduled nursing staff (prn-as needed). The type of data criteria that was utilized was the number of falls that occurred as compared to the number of falls for the specified unit prior to the implementation of the project as well as the results of the pre and post falls knowledge-based questionnaire. The knowledge of falls before and after the intervention and education was compared to see if the interventions and education gathered from the in-service helped to produce a change in practice to decrease falls. The tool that was used to evaluate the outcome was the Nursing Evidence-Based Practice Self-Efficacy Scale adopted from the IOWA model. The data collected was

Table-3: Budget

Expenses			Revenue
Direct		Billing 48 residents on the unit with average cost at $7,000 a month X 1months = $336,000 + 1week at $84,000 = $420,000	$420,000
Salary and benefits –varies due to varying salaries Estimate salary for 13 stna's full time: $10.50hr X 40hrs X 5weeks = $27,300 Nurses (RN,LPN) for 7 full time: $26.50hr X 40hrs X 5weeks = $37,100)	$64,400	Grants	
Supplies Copy paper 1 pack (2.00) Scissor 1 pair (0.00 already have on hand) Lamination paper 1 pack (4.00) Colored paper 1 pack (3.00) Tape 2 rolls (2.00) Yellow socks 1 pair @ 2.00 per pair (estimate 10 residents on unit at risk for falls with each resident getting 3 pairs of socks a piece =$60.00)	$73.00	Institutional budget support	0
Services			
Statistician	0		
Indirect	0		
Overhead	0		
Total Expenses	$64,473	Total Revenue	$420,000
Net Balance			$355,527

pre-intervention and education implementation, and post-intervention and education implementation to see if the self-efficacy of the staff had improved as it related to fall prevention. According to a study conducted by Tucker, Olsen, and Frusti (2009) on the preliminary reliability of the self-efficacy scale, the tool had proved to be reliable and valid for evidence-based practice implementation, however, may need to be used on a larger number of small groups. Therefore, this tool was used for the pilot study of one unit with future anticipation to utilize for other units upon decisions from the facility to further expand the study. In determining the progress of utilizing recommended interventions, audits were performed three times a week to determine if the recommended interventions were being put in place and if the staff participated in the intervention plan (see Table-2).

Table-4: The mean response for the self-efficacy survey data (N = 17)

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	M	SD	SEM
Pre-self-efficacy survey mean responses (March and April)																			
82.50	67.50	71.25	65	60	58.75	75	72.50	68.75	77.50	62.50	71.25	75	80	76.25	70	77.50	71.25	6.88	1.67
Post-self-efficacy survey mean responses (May and June)																			
100	78.75	78.75	92.50	76.25	66.25	86.25	83.75	90	87.50	63.75	87.50	97.50	93.75	97.50	92.50	82.50	85.59	10.38	2.52

Note-1: N demonstrates the number of items on the survey and Q shows the question number.

Note-2: M = Overall mean, SD = Overall standard deviation, SEM = Overall standard error of mean

Note-3: The difference in overall mean responses was -14.34. There was a 14.34% increase in Overall Confidence of evidence-based practice as it relates to falls prevention as a result of the educational intervention; however, the amount of falls did not decrease. The two-tailed t-test value resulted in p =.0001, which represent a statistical significance.

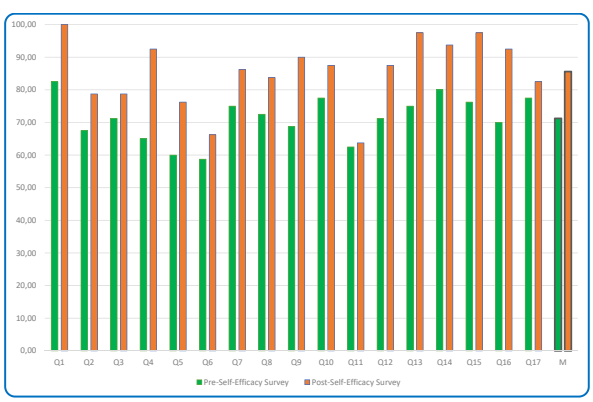

Figure-1: Mean Response for each item of Pre-/Post-S

The data that was produced by the self-efficacy scale was interval data. The type of data that was gathered was the mean, average mean, and standard deviation of the responses that the staff members would be responding to on the scale. A paired t-test was also conducted to determine statistical significance. From these results, it was determined what the average staff member knew about falls prevention prior to implementation and after as well as the significance of the educational intervention. Extraneous variables were controlled by only using the data obtained from participants who complete the pre-survey, education, and post-survey. The audit tools served to identify if the recommended interventions were being implemented. Residents on the audit tool were identified with a letter and number so that their identity would not be revealed. Staffs who were participants in the study had a double letter and number assigned. The assigning of a letter and numbers to particular staff and residents on the falls program served to protect the identity and health information of the resident as well as the identity of the staff.

The number of falls that took place before and during the project was determined through secondary data from quarterly reports. The data prior to the initiation of the project was from March and April of 2017 and included a total number of 17 total falls for the pilot unit. The data from the initiation of the project which was from May and June 2017 and included a total number of 18 falls for the pilot unit. There were a total of four participants who completed all 3 parts of the pilot project in which the pre and post-self-efficacy scales

were compared to determine significance in education and falls correlation. This data was based on the self-efficacy questionnaire. Knowledge of falls prevention and confidence for the pre-survey was gathered first. Then the educational session was provided. Towards the end of the pilot study, the post-test was conducted to determine if confidence levels had changed as a result of the falls prevention program intervention. The average mean of the pre-self-efficacy survey was 71.25% for all participants and the average mean for the post-self-efficacy survey was 85.59% for all participants (see Table-4, Figure-1). There was a 14.34% increase in confidence and knowledge of evidence-based practice in relation to falls prevention as a result of the educational intervention. The paired t-test calculation showed a two-tailed p-value of less than .0001 which by normal distribution is interpreted to be extremely statistically significant which means that the projected outcome was supported in terms of increasing confidence levels of staff; however, this did not have an effect on the rates of falls.During the audits, it was identified that staff members were not utilizing the star identifiers in the resident room's particularly due changes in position on the decision to utilize these identifiers by nursing administration. However, the uses of yellow socks were utilized. Due to the preferences of the residents, all did not wear the yellow socks. Staff who participated in the study utilized the anticipated needs of the residents to provide care to prevent falls per verbal report. Falls risk assessments would have been conducted more often, yet there were a small number of nurses who participated in the study and not many changes occurred in the 8 weeks the study was conducted. The falls rates compared to the rate of confidence increase did not have any correlation with each other which could have been caused by a small sample number and changes in decisions to recommended interventions.

Discussion and Implications for Nursing and Healthcare

The initial question that was tested was to see of an evidence-based practice falls prevention program would decrease falls and improve quality measures in 8 weeks. It was hypothesized that the evidence-based practice falls prevention program would decrease falls and improve quality measures. Based on data collected from the falls prevention pilot study, it can be inferred that the evidence-based practice falls prevention educational intervention improved the confidence and knowledge levels of the staff but did not have a direct effect on the rate of falls. The outcome of the study was to decrease the rate of falls, improve quality measures and improve the confidence of nursing staff in evidence-based practice falls prevention. The data presented a positive correlation between the pre and post survey in relation to the educational intervention. The educational intervention yielded a 14.34% increase in confidence in evidence-based practice falls prevention which means that staff are more confident in their ability to utilize best practices for falls prevention. Limitations to the study include minimal adherence to falls prevention intervention recommendations as presented in the educational sessions due to challenges and changes in the decisions of nursing administration. The validity of the data gathered from the study was limited due to a small number of participants in the study. If there were more participants as well as the implementation of the recommended interventions, then results for the study may have shown a correlation between the confidence of the staff and the rate of falls.

This project can be applied to other long-term care settings as well as residential care facilities such as assisted living for older people. The interventions utilized in this project yielded increases in staff knowledge and confidence which has a positive effect on practice behavior changes that can decrease the likelihood of a fall occurring. Such implication should be facilitated through quality improvement programs in long-term care and residential care facilities. As a result of this project, it is recommended that an increasing number of participants are utilized to validate the results. It is also recommended that if this project will be utilized in another setting, nursing administrative staff should set clear decisions about utilization of any interventions that are recommended to decrease falls risk in order to allow staff to use any enhan-

ced knowledge of evidence-based practice falls prevention derived from the project intervention, as a way to practice on a higher level. Further steps for this project entails, extending the falls prevention program to other long-term care units in the current facility in order to expand the number of participants in the study as well as seek further decisions on the use of recommended interventions for falls prevention in order to determine a correlation between evidence-based practice falls prevention knowledge and the number of falls.

Dissemination

The information was presented during a falls meeting. The previous trend of the previous falls intervention was compared to results and implementations in the change project. The final outcome of the project change was reviewed and then presented with recommendations and consultation on a proposed policy as a result of the project. During the project, the recommended interventions discussed during the educational sessions were not all implemented due to a change in a decision with the director of nursing. Therefore, the recommendation for interventions was still in the process of determination as is the sustainability. The director had concerns about thoughts and views of state surveyors and identifying residents who are falls risk in which initial recommendations were made to discreetly place identifier in rooms and utilize yellow socks.

Summary and Conclusion

In conclusion, falls are a danger to the lives of older people in long-term/skilled nursing facilities. Falls can cause injury which can conclude to death and poor quality of life. Older people in long-term/skilled nursing facilities can benefit and improve quality of life through improvements in quality of care by way of evidence-based practice falls prevention programs. The falls prevention program was conducted to address the significant problem of falls amongst older people in such facilities to improve current practice methods and improve knowledge and practice in order to support quality of care and improve quality of life for the older people served. This falls prevention program was developed through a rigorous search of evidence-based practice literature and recommendations with the common theme being to educate staff on evidence practice knowledge on falls prevention utilizing a resident/patient-centered approach. This paper has described in detail the implementation of an evidence-based practice falls prevention program utilizing Lewin's theory of change and the Plan-Do-Study-Act quality improvement models; as well as practice recommendations, the setting for the project, the mission, vision, and goals; the project description, evaluation, implications, and dissemination. Therefore, the ability to promote and actuate a practice change that will improve the quality of care and influence quality measures was presented.

Acknowledgment

This paper is submitted in partial fulfillment of the requirements for the Doctor of Nursing Practice degree.

References

Batra, A., Page, T., Melchior, M., Seff, L., Vieira, E. R., & Palmer, R. C. (2013). Factors associated with the completion of falls prevention program. *Health Education Research, 28*(6), 1067-1079. [Crossref]

Farag, I., Howard, K., Ferreira, M. L., & Sherrington, C. (2015). Economic modelling of a public health programme for fall prevention. *Age and Ageing, 44*(3), 409-414. [Crossref]

Haas, R., Mason, W., & Haines, T. P. (2014). Difficulties Experienced in Setting and Achieving Goals by Participants of a Falls Prevention Programme: A Mixed-Methods Evaluation. *Physiotherapy Canada, 66*(4), 413-422. [Crossref]

Hang, J.-A., Francis-Coad, J., Burro, B., Nobre, D., & Hill, A.-M. (2016). Assessing knowledge, motivation and perceptions about falls prevention among care staff in a residential aged care setting. *Geriatric Nursing, 37*(6), 464-469. [Crossref]

Heinrich, S., Rapp, K., Stuhldreher, N., Rissmann, U., Becker, C., & König, H.-H. (2013). Cost-effective-

ness of a multifactorial fall prevention program in nursing homes. *Osteoporosis International, 24*(4), 1215-1223. [Crossref]

IHI (Institute for Healthcare Improvement) (2017). Science of improvement: Testing changes. Institute for Healthcare Improvement. Retrieved from http://www.ihi.org

Jackson, K. M. (2016). Improving nursing home falls management program by enhancing standard of care with collaborative care multi-interventional protocol focused on fall prevention. *Journal of nursing education and practice, 6*(6), 84-96. [Crossref]

Johansson, E., Borell, L., & Jonsson, H. (2014). Letting go of an old habit: group leaders' experiences of a client-centred multidisciplinary falls-prevention programme. *Scandinavian Journal of Occupational Therapy, 21*(2), 98-106. [Crossref]

Nitz, J., Cyarto, E., Andrews, S., Fearn, M., Fu, S., Haines, T., . . . Robinson, A. (2012). Outcomes from the Implementation of a Facility-Specific Evidence-Based Falls Prevention Intervention Program in Residential Aged Care. *Geriatric Nursing, 33*(1), 41-50. [Crossref]

Rojas-Fernandez, C. H., Seymour, N., & Brown, S. G. (2014). Helping pharmacists to reduce fall risk in long-term care:A clinical tool to facilitate the medication review process. *Canadian Pharmacists Journal / Revue des Pharmaciens du Canada, 147*(3), 171-178. [Crossref]

Studdert, D. M., Spittal, M. J., Mello, M. M., O'Malley, A. J., & Stevenson, D. G. (2011). Relationship between Quality of Care and Negligence Litigation in Nursing Homes. *New England Journal of Medicine, 364*(13), 1243-1250. [Crossref]

Sutherland, K. (2013). Applying Lewin's change management theory to the implementation of bar-coded medication administration. *Canadian Journal of Nursing Informatics, 8*(1-2).

Tucker, S. J., Olson, M. E., & Frusti, D. K. (2009). Evidence-based practice self-efficacy scale: Preliminary reliability and validity. *Clinical Nurse Specialist, 23*(4), 207-215.

Urquhart Wilbert, W. (2013). The Effectiveness of a Fall Prevention/Management Program In Reducing Patient Falls: A Retrospective Study. *JOCEPS: The Journal of Chi Eta Phi Sorority, 57*(1), 24-27.

Vlaeyen, E., Coussement, J., Leysens, G., Van der Elst, E., Delbaere, K., Cambier, D., . . . Milisen, K. (2015). Characteristics and Effectiveness of Fall Prevention Programs in Nursing Homes: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Journal of the American Geriatrics Society, 63*(2), 211-221. [Crossref]

JOURNAL of AGING and LONG-TERM CARE
www.agingandlongtermcare.com

ISSN 2619-9017 | E-ISSN 2618-6535

ORIGINAL RESEARCH

2018, 1(2), 89-98
doi: 10.5505/jaltc.2018.25733

Experiences of Older Adults and Long-Term Care Institutions Regarding Technical Solutions: Evaluation Results from Austria

Martin Pallauf[1] Manfred Kofler[2] Bernd Seeberger[1]

Abstract

Ambient Assisted Living solutions (AAL solutions) are designed to make an important contribution to an active, independent, safe and socially integrated life in old age. In the scope of the *West-AAL* project, ICT-based (Information and Communication Technology) living and housing using AAL solutions was tested actively in more than 60 households of independent older adults in West Austria over a longer period. An evaluation strategy was developed that comprises both qualitative and quantitative aspects. Within this strategy, selected aspects of quality of life were used as indicators. The presentation of results is oriented towards the fields of application of tAALxonomy. The following fields were used in this project: Leisure and Culture, Information and Communication, Health and Care, Housing and Buildings and Safety and Protection. During the test period, habituation effects are to be expected, which are reflected in the results. The project is characterized by the test subjects' individual choice of solutions. No general assertions can be made based on these, but due to the methodical consolidation using tAALxonomy, a larger random sample per field of application can be achieved.

Keywords: Ambient assisted living, technical solutions, evaluation, gerontechnology, gerontology.

Key Practitioners Message

- Older adults are generally open to use new technical solutions.
- However, it requires the accompaniment and guidance of relatives or professional caregivers for permanent use.
- The willingness of older adults to use technical solutions is decreasing if the devices do not work properly.
- The willingness to use technical solutions is increasing when the personal benefit is recognized.

Introduction

Ambient Assisted Living solutions (AAL solutions) aim to be an important contribution to an active, independent, safe and socially integrated life in old age. In the scope of the *West-AAL* project, ICT-based living and housing using AAL solutions was tested actively in more than 60 households of independent older adults in West Austria over a longer period. An AAL solution means that the test subjects are given a technical device to use free of charge for the duration of the test.

The consortium of the *West-AAL* test region comprised four research institutes, two ICT service providers/system integrators and six mobile and social services providers (test facilities). The test

Correspondence: Martin Pallauf, Eduard Wallnoefer Zentrum 1, Hall In Tirol, 6060, AUSTRIA.
e-mail: martin.pallauf@umit.at
Authors: [1] UMIT – Private University For Health Sciences, Medical Informatics And Technology, Institute For Gerontology And Demographic Development, AUSTRIA [2]University Of Innsbruck, Institute For Strategic Management, Marketing And Tour

Received: 24 January 2018 | *Accepted:* 5 August 2018 | *Published Online:* 15 August 2018

National Association of Social and Applied Gerontology

settings here ranged from mobile care and older adult's apartments to assisted living. The total duration of the project was set down as 3.5 years (January 2014 – May 2017) and it was supported by the Austrian Ministry of Transport, Innovation, and Technology (BMVIT) in the scope of the *benefit* funding programme, with the thematic focus on the test region *Smart Homes – Smart Services*. The focus here is on benefit-oriented innovative smart home and smart service solutions, which are based on the latest information technologies, and are used in assisted and sheltered living, as well as in the general living environment in the interests of the occupants and the operators.

In the test region, technical and service-oriented solutions from research projects together with solutions already available on the market were tested regarding their widespread and combined use. Priority was given here not only to technical integration, but also to the application and embedding of AAL solutions in existing structures, together with creating new services and verifying the forecasted benefits along the whole value chain. This also aimed to create socio-economically acceptable future application scenarios.

The aim of the project was to offer each of the older adults taking part an individually tailored solution package. To do this, first a product catalog was compiled, which was subsequently adapted to suit the wishes and requirements of the participants. This made it possible to define a specific user-oriented selection of technical solutions. This was carried out in the interests of both the test subjects and the testing facilities.

Methodology

During the project, an evaluation strategy was developed for the 10-month test period, which included both qualitative and quantitative aspects. Within this mix of methods (Mayring, 2001), selected aspects of quality of life were used as indicators.

A questionnaire that comprised two dimensions was developed to collect the quantitative data. To begin with, test subjects were asked about their emotions while using technical solutions. Then there was a comprehensive block of questions about the effects of the solutions used on previously defined areas of life. In accordance with the project structure, these were: everyday activities and routines, freedom of movement, convenience, autonomy/independence, health, personal security, and frequency of contact with family and friends. These questions were asked separately for every solution used. The questionnaires were employed at five scheduled data collection points in time, each eight weeks apart, and were therefore called *regular questionnaires*. The data collected was evaluated using Version 22D of the SPSS statistical data evaluation programme. The analysis was carried out purely descriptively, using 5- or 7-point Likert scales.

Parallel to this, qualitative data was collected. This took place in the form of experience days (focus groups with staff and test subjects), reflective discussions (guided interviews), keeping a research diary (scientists' diary), filling out feedback forms, and making a support system available. This involved employees of the partner research institute visiting the test facilities and asking the test subjects about their experiences in using the technical solutions. The answers were documented, compiled and then categorized. The participating test facilities were also given the option of conveying their experiences via questionnaires, in order to achieve a comprehensive overview of the progress of the test period. All support inquiries were collected via a central tool and used in the qualitative analysis accordingly. All qualitative data were evaluated using an in-house evaluation matrix based on Microsoft Excel 2016.
The results presented below represent a selection of the evaluated data.

Annotated Presentation of the Results

In the following, the results of the data collections during the test period are presented. The presentation of the results is oriented towards the fields of application of tAALxonomy (2015). This is an AAL specific taxonomy, which groups AAL solutions (products and services) to fields of application; it was developed by the University of Innsbruck in 2015. The following fields of application were used for this project: Leisure and Culture, Information and Communication, Health and Care,

Housing and Buildings and Safety and Protection. These fields have to be consolidated, as only a small number were tested per solution due to the tailor-made solution packages.

To begin with, the quantitative data for each of these fields of application is presented graphically. Here the development of the influence on the selected quality of life indicators when using AAL solutions during a test period of 10 months is analyzed and presented. In addition to this, the qualitative data is processed using the same structure.

The graphic color scheme represents the following: regular questionnaires at collection date 1 (light green) increasing to regular questionnaires at collection date 4 (dark green) plus regular questionnaires at collection date 5 (orange).

The sociodemographic data of the participants were collected in an initial questionnaire. A total of 62 persons participated in this survey, who were on average 78.66 years old (mean, ± SD: 10.50, MD: 81). Of these, 45 persons (72.6%) were female and 17 persons (27.4%) were male. However, as not all participants have completed all the questionnaires, the number of completed items is less than the total number of the participants. The number (n) of questionnaires per question block is listed in the appendix.

Emotions

The test subjects were asked here which of the emotions listed below they experienced while using the solutions. A semantic differential was selected for the survey, in which opposite emotions were entered as pairs. It can be concluded that throughout all collection dates the test subjects' emotions were rated altogether positively. It becomes clear that fluctuation – except for the *isolated/integrated* pair of emotions – is relatively small. This means that the test subjects experienced practically consistent emotions during the whole test period.

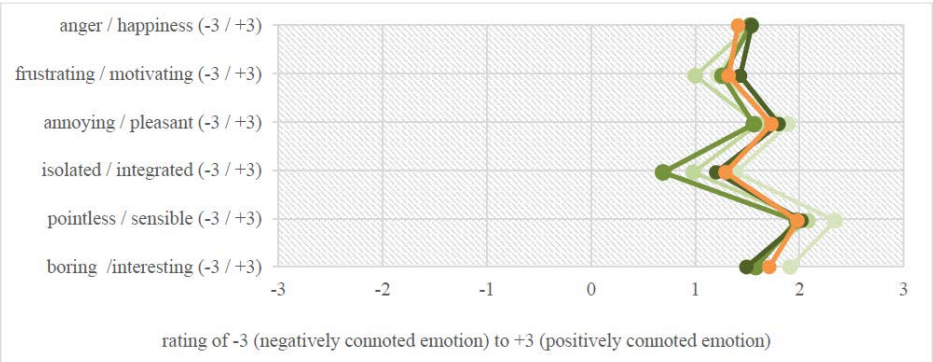

Figure 1: Emotions

Effects of the Solutions on the Leisure and Culture Field of Application

Here the test subjects were asked what effects the *Leisure and Culture* solutions have on pre-defined areas. In this field of application, the following

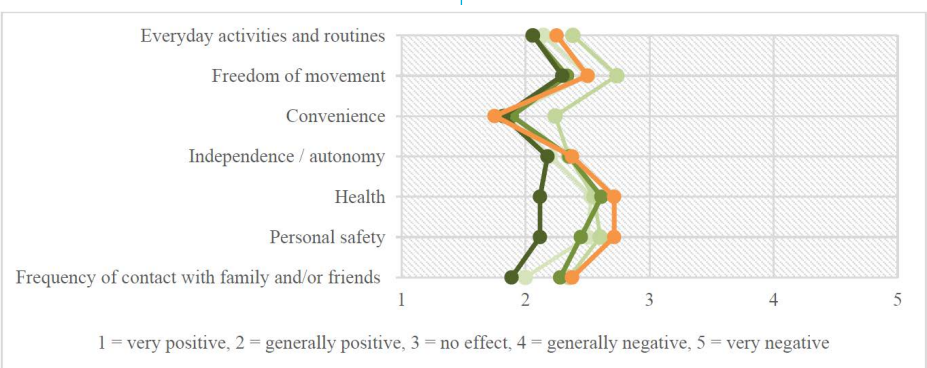

Figure 2: Effects of the solutions on the Leisure and Culture field of application

technical solutions were presented as a group: tablet solutions, which provide functions for entertainment, photo management, and exchange, and memory training.

Quantitative results

From the quantitative data, it can be established that the test subjects experienced positive effects of the solutions on all indicators of quality of life they were asked about. The positive perception of *convenience* is particularly prominent, which increased during the whole test period. In aspects of life such as *personal safety, health,* and *frequency of contact* there is a deterioration, which could be because the solutions were unable to influence these aspects noticeably.

Qualitative results

From the qualitative data, it can be established that the test subjects questioned are very satisfied with the functions offered, are able to manage them well and have fun using them. However, it is viewed as a problem that apps crash and that tablets sometimes perform their task badly. Physically active people tend to use tablets less.

The test facilities concluded that using auxiliary pens to operate tablets is perceived as helpful. The configuration of the tablets is described as complex, and partly weak performance is also reported. Some of the functions offered, e.g. zoom, could not be accessed in some cases.

Effects of the Solutions on the Lnformation and Communication Field of Application

Here the test subjects were asked what effects the *Information and Communication* solutions have on pre-defined areas. In this field of application, the following technical solutions were presented as a group: tablet solutions, which offer functions for video and phone telephony, information, reminders, messages, and emails.

Quantitative results

The quantitative data shows that all indicators register a positive influence on the quality of life. In the aspects of *Independence/Autonomy* and *Comfort,* the positive perception is at its strongest at the end of the test period. The frequency *of Contact with Family and Friends* is also generally positively rated. This is probably due to the use of video and phone telephony, which also became clear in the qualitative data.

Qualitative results

The qualitative data illustrates that video telephony is used very well by the test subjects, especially when communicating with relatives abroad. Some subjects only read their daily newspaper on their tablet. Subjects reported that it is easy to learn how to use the functions. In some cases, there were problems connecting to the internet. Some subjects find writing emails difficult, and some thought there might be a danger of spending too much time with the tablet.

The test facilities report that subjects really like using the tablets, after initial skepticism. The functions available are interesting and provide motivation to take part in the project. They also report that most of the test subjects use the functions independently. When problems arise, the tablet is restarted to solve these. It is often difficult to find free apps without advertising – which older

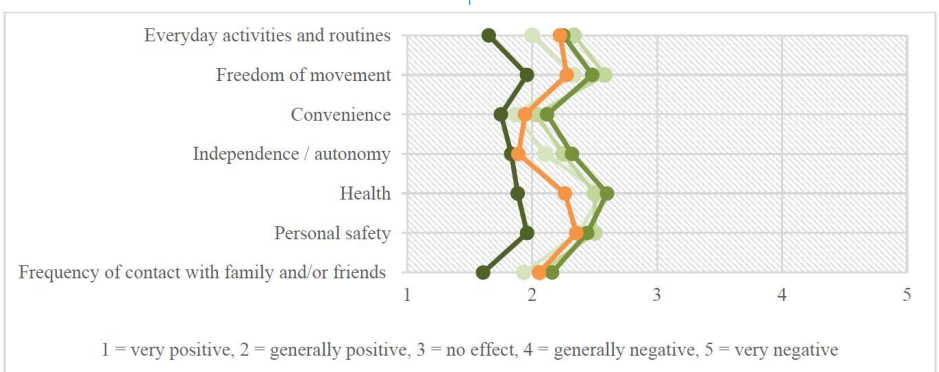

Figure 3: Effects of the solutions on the Information and Communication field of application

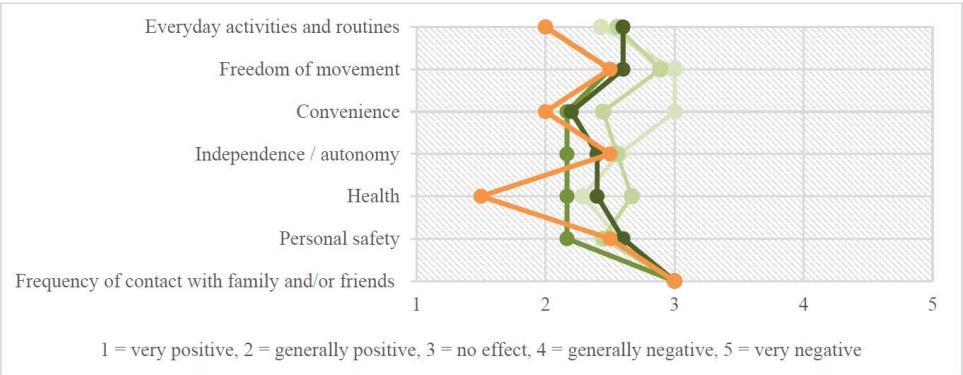

Figure 4: Effects of the solutions on the Health and Care field of application

adults find annoying and troublesome. Subjects also complain that tablets switch to standby quickly and that the test facility staff have to provide a high level of supervision.

Effects of the Solutions on the Health and Care Field of Application

Here the test subjects were asked what effects the *Health and Care* solutions have on pre-defined areas. In this field of application, the following technical solutions were presented as a group: tablet solutions, which offer functions for monitoring vital bodily data, solutions for inactivity recognition and automated notification regarding the day's progress.

Quantitative results

The quantitative data in this field of the application indicates an improvement in rating during the test period. Only the *Frequency of Contact* aspect remains unchanged, while all other aspects are given an improved rating. Towards the end of the test period, the rating of the *Health* aspect becomes more positive. This could be because the benefit, which is focused on particularly in this field, is also appreciated accordingly.

Qualitative results

In the qualitative data, test subjects report using the solution on a regular weekly basis. However, weighing themselves is considered demanding, as they have to keep their balance.

The staff at the test facilities report that test subjects find using the blood pressure cuff difficult. This is mostly only used by the supervisory staff at the test facilities.

Effects of the Solutions on the Living and Buildings Field of Application

Here the test subjects were asked what effects the *Living and Building* solutions have on pre-defined areas. In this field of application, the following technical solutions were presented as a group: house automation solutions, which offer functions that control light, heating and shutters, together with automatic switch-off for electric cookers and other electrical devices, radio keys and automated notifications regarding room temperature and humidity.

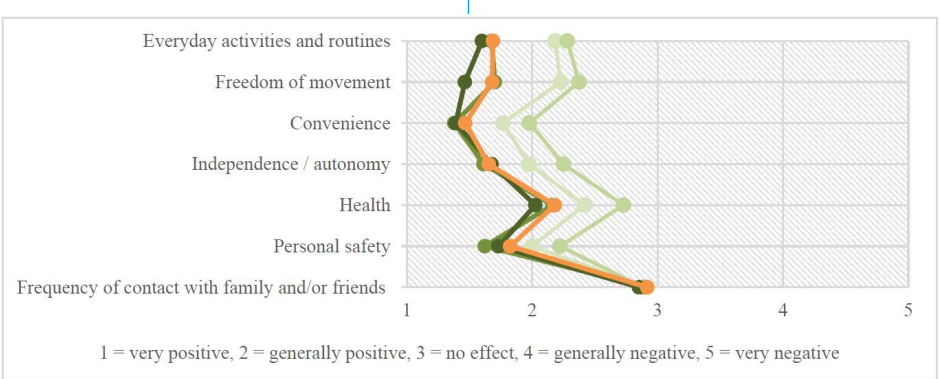

Figure 5: Effects of the solutions on the Living and Buildings field of application

Quantitative results

In this field of application, the data show a positive rating throughout almost all areas. Only *Frequency of Contact*, which is also not addressed by the solutions included here, receives a consistently neutral rating. All the other areas are given increasingly positive ratings during the test period.

Qualitative results

The qualitative data shows that test subjects really like the night-time lighting scenarios and that these also reduce their fear of falling. Access control using a radio key is considered convenient. Remote control for various facilities (e.g. heating or lighting control) is rated positively. The test subjects express their pride in having a house automation system. On the other hand, one criticism is that the lighting does not always work as desired. The new wall-mounted light switches also take some getting used to.

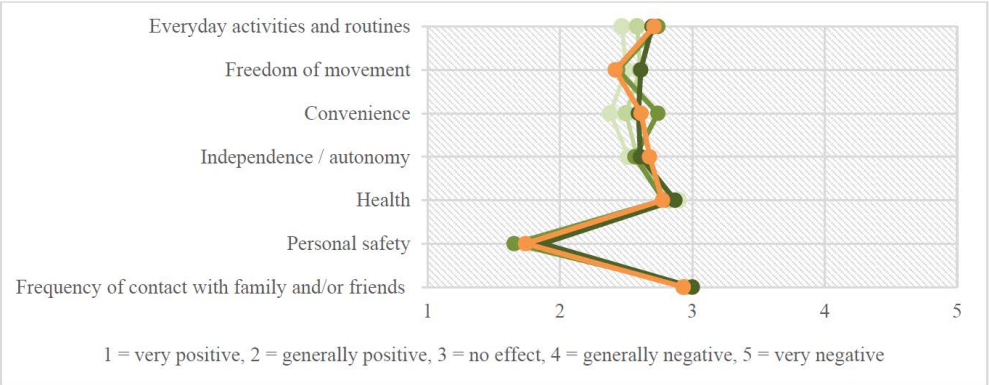

Figure 6: Effects of the solutions on the Safety and Protection field of application

The test facilities find it good that the scenarios are tailored to the individual needs of the respective test subject. It is also apparent that the test subjects are proud of using a house automation system. Any problems arising from the house automation systems could generally be solved by restarting the systems. Battery life has to be considered in radio-controlled systems, in order to ensure the functionality of the scenarios.

Effects of the Solutions on the Safety and Protection Field of Application

Here the test subjects were asked what effects the *Safety and Protection* solutions have on pre-defined areas. In this field of application, the following technical solutions were presented as a group: various solutions for fall recognition and fall alarm, house automation solutions which act as fire, smoke or flood alarm, together with automated safety notifications.

Quantitative results

The solutions which are addressed in this field of application are aimed at the personal safety of the test subjects, which is reflected well in the quantitative data. In all areas, ratings are very consistent throughout the test period. The *personal safety* aspect stands out as being rated especially positively.

Qualitative results

In the qualitative results, the test subjects report that using safety solutions increases their feeling of personal safety. They do not want to do without the solutions any longer, because of the functionality these offers. These solutions also integrate themselves into the living environment and have no disturbing effect. Subjects find the emergency function very complicated, but this can be made easier with regular practice. The further recommendation of a safety solution within one test facility by a test subject led to the recruitment of a new test subject.

The test facilities reported that as a result of experience during the test period, changes in the configuration could reduce the number of false alarms. The positioning function of a safety solution works well and reliably. In one instance, the

smoke alarm integrated into the house automation system prevented the fire service having to be called. False alarms caused by pets are seen as a negative aspect.

Discussion

During the course of the 10-month test period, habituation effects are to be expected, which are reflected in the data results. This means that using the technical solutions leads to perceived normality, and the initial increased interest also wanes slightly. The distinctive design of the project lay in the fact that test subjects selected the technical solutions individually. No ready-made solution packages were offered, as packages were derived from combining individual solutions which met the requirements of the test subjects. For this reason, it is not possible to make any generalizable statements, but due to the methodical consolidation using tAALxonomy (2015), it was possible to achieve a larger random sample per field of application.

Experience derived from the whole course of the project is that the comprehensive involvement of a wide range of protagonists is required, in order to enable older adults to use the technical solutions regularly and in a useful way. This includes, for example, system developers, scientists (such as gerontologists) and various institutions (Marschollek & Künemund, 2014). Without the involvement of this group of people, older adult's use of the solutions would be more limited. However, it is the people close to the test subjects, such as relatives, friends or acquaintances, who play a vital role here, in that they have easy access to the target group, and can act as facilitators and helpers for older adults using modern technologies (Erickson & Johnson, 2011; Nägle & Schmidt, 2012).

One problem that can be ascertained in the way older adults deal with technical devices is the constant change in individual living conditions and environmental parameters. This concerns both the health and social conditions of older adults and the speed of technological advance. The coming together of the individual and technical solutions makes it difficult for a relationship between user and technology to be created, and therefore this remains a challenge (Rodeschini, 2011).

An important finding - seen over the entire project period - turned out to be that the perceived emotions were relatively constant. It should be emphasized above all that the rating of all queried emotions was consistently on the positive side of the semantic differential.

From the qualitative statements of the test subjects, it can be established that the tendency is to rate the AAL solutions positively. In comparison, the ratings given by the test facilities are similar in many ways, but personal supervision is required, in the sense of giving advice, which is not perceived by the test subjects to the same degree.

Nevertheless, being confronted with modern technologies leads to an increase in cognitive competence. It gives the people who cited the need for safety as a reason for taking part in the project an enhanced feeling of safety, for example, such as in potential situations where they could fall, or when they are alone in their private living environment.

Using devices that support communication resulted in an expansion of communication activities. This meant for example that using Skype was adopted willingly, to contact relatives living far away and communicate with each other. However, it has to be noted that technically supported communication in no way replaces communication in person but is seen rather as an extension of this.

A gerontological finding became apparent with regard to the following conclusion: initial difficulties with using the technical devices were expected, as the target group was not regarded as being familiar with technology. However, it turned out and became clear that the people participating had actually had to deal with technical innovations in their previous life. Thus, the introduction of television, for example, or the increasingly widespread use of the telephone had effects reaching into people's daily routines and cultural and leisure habits. The automation of household devices such as washing machines or the increasing automation in cars also required people to get used to and adjust to technical innovations. These technical experiences and adaptive capacities should

not be underestimated and must be considered in future projects. The test subjects tend to be willing to accept and learn how to deal with technical innovations, rather than reject them.

References

Erickson, J., & Johnson, G. M. (2011). Internet use and psychological wellness during late adulthood. *Canadian Journal on Aging [La Revue Canadienne du Vieillissement], 30*(2), 197-209. [Crossref]

Marschollek, M., & Künemund, H. (2014). Gerontechnologie zwischen akzeptanz und evidenz [Gerontechnology between acceptance and evidence]. *Zeitschrift für Gerontologie und Geriatrie [Journal for Gerontology and Geriatrics], 47*(8), 639-640. [Crossref]

Mayring, P. (2001). Kombination und integration qualitativer und quantitativer analyse [Combination and integration of qualitative and quantitative analysis]. *Forum Qualitative Sozialforschung [Forum Qualitative Social Research], 2*(1). [Crossref]

Nägle, S., & Schmidt, L. (2012). Computer acceptance of older adults. *Work and Stress, 41*(1), 3541-3548. [Crossref]

Rodeschini, G. (2011). Gerotechnology: A new kind of care for aging? An analysis of the relationship between older people and technology. *Nursing & Health Sciences, 13*(4), 521-528. [Crossref]

tAALxonomy (2015, 07.04.2017). tAALxonomy - Entwicklung einer praktikablen Taxonomie zur effektiven Klassifizierung von AAL-Produkten und –Dienstleistungen (Development of a Practicable Taxonomy for the Effective Classification of AAL Products and Services). Retrieved from https://iktderzukunft.at/resources/pdf/taalxonomy-studienbericht.pdf.

Appendix

Regular questionnaires had to be filled out at five collection dates during the test period of ten months. Due to changes in the participants' group (and concerning that, not all participants have completed all the questionnaires), the number of answers given is varying. With reference to the results in this paper, the following figures show the number of questionnaires filled out per collection date (questionnaires at collection date 1-5 = Q1-Q5)

Table-1: Emotions*

	Q1	Q2	Q3	Q4	Q5
anger / happiness	42	47	34	41	41
frustrating / motivating	42	47	34	40	41
annoying / pleasant	45	48	34	40	41
isolated / integrated	44	43	32	40	41
pointless / sensible	44	48	34	41	41
boring / interesting	44	48	33	41	41

* Note: Please indicate which of the following emotions you feel when using the solutions.

Table-2: Effects of the solutions on the Leisure and Culture field of application*

	Q1	Q2	Q3	Q4	Q5
Everyday activities and routines	21	21	18	17	8
Freedom of movement	20	19	18	17	8
Convenience	19	21	18	17	8
Independence / autonomy	20	20	17	17	8
Health	19	20	18	17	7
Personal safety	18	20	18	17	7
The frequency of contact with family and/or friends	20	20	18	18	8

* Note: How does the use of the technical solution XY affect the following areas?

Table-3: Effects of the solutions on the Information and Communication field of application*

	Q1	Q2	Q3	Q4	Q5
Everyday activities and routines	30	33	24	26	18
Freedom of movement	27	31	25	24	18
Convenience	30	33	25	24	18
Independence / autonomy	29	32	25	24	18
Health	27	32	25	26	19
Personal safety	27	32	25	24	17
The frequency of contact with family and/or friends	30	33	25	28	18

* Note: How does the use of the technical solution XY affect the following areas?

Table-4: Effects of the solutions on the Health and Care field of application*

	Q1	Q2	Q3	Q4	Q5
Everyday activities and routines	7	9	6	5	2
Freedom of movement	7	9	6	5	2
Convenience	7	9	6	5	2
Independence / autonomy	7	9	6	5	2
Health	7	9	6	5	2
Personal safety	7	9	6	5	2
The frequency of contact with family and/or friends	7	9	6	5	2

* Note: How does the use of the technical solution XY affect the following areas?

Table-5: Effects of the solutions on the Living and Buildings field of application*

	Q1	Q2	Q3	Q4	Q5
Everyday activities and routines	44	43	37	40	51
Freedom of movement	44	43	37	41	50
Convenience	43	45	37	41	51
Independence / autonomy	43	44	36	40	49
Health	43	44	37	40	50
Personal safety	44	45	37	41	51
The frequency of contact with family and/or friends	43	44	35	40	49

* Note: How does the use of the technical solution XY affect the following areas?

Table-6: Effects of the solutions on the Safety and Protection field of application*

	Q1	Q2	Q3	Q4	Q5
Everyday activities and routines	30	38	23	23	31
Freedom of movement	30	38	23	23	31
Convenience	29	38	23	22	31
Independence / autonomy	29	38	23	23	31
Health	29	38	23	23	31
Personal safety	29	38	23	23	31
The frequency of contact with family and/or friends	29	38	23	23	29

* Note: How does the use of the technical solution XY affect the following areas?

JOURNAL of AGING and LONG-TERM CARE
www.agingandlongtermcare.com
ISSN 2619-9017 | E-ISSN 2618-6535

Copyright Transfer Form

All authors of the manuscript titled:

……

……

certify that they qualify for authorship because of substantial contribution to the work submitted. The authors undersigned declare that this manuscript has not been published nor is under simultaneous consideration for publication elsewhere. The authors agree to transfer the copyright to the "**Journal of Aging and Long-Term Care"** to be effective if and when the manuscript is accepted for publication and that the manuscript will not be published elsewhere in any other language without the consent of the **Journal of Aging and Long-Term Care**. The final form of the manuscript has been seen and approved by all authors.

Authors, Name, Surname	Date	Signature
1. ……		
2. ……		
3. ……		
4. ……		
5. ……		
6. ……		
7. ……		
8. ……		

Explanations;

……

Correspondent author:

Name Surname:
Address:
Date:

Telephone:
Fax:
e-mail:

JOURNAL of AGING and LONG-TERM CARE
www.agingandlongtermcare.com
ISSN 2619-9017 | E-ISSN 2618-6535

Instructions to Authors

JALTC Journal Rules

The Journal of Aging and Long-Term Care (JALTC) is being established as open access and quarterly peer-reviewed journal that accepts articles in English. Articles submitted should not have been previously published or be currently under consideration for publication any place else and should report original unpublished research results. The journal does **not expect any fees for publication**. All articles are available on the website of the journal with membership.

The quantitative, qualitative and mixed-method research approaches are welcome from disciplines including but not limited to education, gerontology, geriatrics, nursing, care and hospice, social work, psychology, sociology, biology, anthropology, economics and business administration, engineering, gerontechnology, law, human rights, public policy, architecture, women studies, rehabilitation, and dietetics.

Prospective authors are cordially invited to contribute clearly written original empirical research manuscripts, reviews, brief report, hypothesis & theory, clinical trial, case report or discussion, short communications, and case studies, general commentary, debates and controversies, care facility and services, book review, editorial or guest editorial and erratum including innovative practices from the field as well as relevant philosophical and ethical perspectives on long-term care and older adults.

The review process for submitted manuscripts has been planned **not to exceed four months.** All research articles submitted to the journal will undergo **rigorous peer review**, based on initial editor screening and anonymous refereeing by two peers.

Scientific and Ethical Responsibility

Authors, as they contribute to the academic-scientific article on the cover page, share the scientific and ethical responsibility. After acceptance of manuscripts, then is confirmed that it belongs to the Journal and copyright passes on the publisher.

Authors should ensure accepting scientific and ethical responsibility by avoiding unacceptable or improper behaviors of falsified research, fraudulent data, paraphrasing, duplication, and blatant plagiarism. Authors should also keep in mind the terms emphasizing “ageism” need to be avoided in using to describe the population. Discrimination based on age should be avoided by considering two statements:

> *“Elderly is not acceptable as a noun and is considered pejorative by some as an adjective. Older person is preferred. Age groups may also be described with adjectives: gerontologists may prefer to use combination terms for older age groups (young-old, old-old, very old, and oldest old), which should be used only as adjectives. Dementia is preferred to senility; senile dementia of the Alzheimer’s type is an accepted term” (The American Psychological Association, Section 2.17 Age, p. 69).*

> *“Age.–Discrimination based on age is ageism, usually relevant to older persons. Avoid using age descriptors as nouns because of the tendency to stereotype a particular group as having a common set of characteristics. While in general the phrase the elderly should be avoided, use of the elderly may be appropriate (as in the impact of Medicare cuts on the elderly, for example). Otherwise terms such as older person, older people, elderly patients, geriatric patients, older patients, aging adult, or the older population are preferred” (The American Medical Association, Inclusive Language Section, 9.10.3, p. 268).*

The **Copyright Transfer Form** should be signed by all the authors.

Preparation of Manuscripts

Only the articles sent online can be evaluated. The authors should submit their manuscripts online via the journal’s website at http://agingandlongtermcare.com. In addition, the authors can register to the link www.journalagent.com/jaltc site to send the article and track the progress of evaluation.

Information about the application should be entered into the system in nine complete steps: (1) Manuscript and Abstract Information (2) Affiliation(s) (3) Author(s) (4) Corresponding Author Information (5) Manuscript

ISSN 2619-9017 | E-ISSN 2618-6535

Title (6) Abstract (7) Keywords (8) Comments to Editorial Office (9) Upload Files. The information about manuscript type and category, the author name(s), name of the institution, affiliations, an address for correspondence (including the name of the corresponding author with an e-mail address and fax and phone numbers) and ORCID ID for author(s) should be entered in the system.

ORCID is part of the wider digital infrastructure needed for researchers to share information on a global scale. In this respect, the authors should use an internationally recognized ORCID identification number to avoid difficulties that occasionally arise as a result of similarities in names and surnames also to enable transparent and trustworthy connections between researchers

The latest version of The American Psychological Association (APA) Style, namely the APA 6th Edition, should be followed when formatting articles. The manuscript file must be double spaced, including the references and tables, and the text should be left justified. Tables and figures must be fully prepared for publication according to APA guidelines. Detailed information on the latest APA Style can be found on the following website: http://www.apastyle.org

Language:

It is recommended that authors use American English spelling.

Length of Articles:

The whole manuscript must not exceed maximum 8000 words, including abstract, keywords, key practitioners message, the article itself, tables and figures, and references.

Line Spacing and Font:

Articles should be double-spaced excluding abstracts, notes and references and should be submitted in 12pt Times New Roman font.

Title Page and Abstract:

The **title** should consist of 30 or fewer words.

An **Abstract** must include a maximum of 300 words (including citations if used) and be provided on a separate page.

Keywords must include a minimum of 5 to 8 words and/or phrases.

Key Practitioners Message must include 3 to 5 bullets

Reference Citation:

Reference citations in the text and in the reference list proper should follow conventions listed in the Publication Manual of the American Psychological Association latest edition (6th ed.), referred to hereinafter as the APA Manual. Provide a reference or bibliography that lists every work cited by you in the text. It is recommended that authors use Citation Management Software Programs for reference citation; please look at web pages of EndNote (www.endnote.com), RefWorks (www.refworks.com), Papers (www.mekentosj.com), Zotero (www.zotero.org), and Mendeley (www.mendeley.com).

Journal Articles:

Lo, C. L., & Su, Z. Y. (2018). Developing multiple evaluation frameworks in an older adults care information system project: A case study of aging country. *Journal of Aging and Long-Term Care, 1*(1), 34-48. doi:10.5505/jaltc.2017.65375.

Edited Book:

Whitbourne, S. K. (Ed.) (2000). *Wiley Series on Adulthood and Aging. Psychopathology in Later Adulthood*. Hoboken, NJ, US: John Wiley & Sons Inc.

ISSN 2619-9017 | E-ISSN 2618-6535

Book Section:

Bowen, C. E., Noack, M. G., & Staudinger, U. M. (2011). Aging in the Work Context. In K. W. Schaie & S. Willis (Eds.), *Handbook of the Psychology of Aging (7th Ed.)* (pp. 263-277). San Diego: Academic Press.

Web Page:

Borji, H. S. (2016, 25.07.2016). Global Economic Issues of an Aging Population. Retrieved from http://www.investopedia.com/articles/investing/011216/4-global-economic-issues-aging-population.asp.

Figures and Tables:

Figures and tables should be numbered using Arabic numerals. The same information should not appear in both a figure and a table. Each table and figure must be cited in the text and should be accompanied by a legend on a separate sheet.

Authors are responsible for all statements made in their work, and for obtaining permission from copyright owners to reprint or adapt a table or figure or to reprint quotations from one source exceeding the limits of fair use.

Plagiarism Checking:

All manuscripts are scanned with a plagiarism checker to deter and prevent plagiarism issues before submission.

Copyediting and Proofs:

Manuscripts will be evaluated on the basis of style as well as content. Some minor copyediting may be done, but authors must take responsibility for clarity, conciseness, and felicity of expression. PDF proofs will be sent to the corresponding author. Changes of content or stylistic changes may only be made in exceptional cases in the proofs.

JOURNAL of AGING and LONG-TERM CARE
www.agingandlongtermcare.com
ISSN 2619-9017 | E-ISSN 2618-6535

Vision and Mission

The major goal of the ***Journal of Aging and Long-Term Care (JALTC)*** is to advance the scholarly contributions that address the theoretical, clinical and practical issues related to aging and long-term care. The ***JALTC***, while making efforts to create care services for older people at the best quality available that are more humane, that pay special attention to people's dignity, aims from the perspective of the whole aging process- to discuss Social Care Insurance as a human right, to contribute care for older people to be transformed into an interdisciplinary field, to integrate care services for older people and gerontological concepts and to create more effective collaboration between them, to enhance the quality of care services for older people and the quality of life of caregivers from medical, psychological and sociological perspectives, to highlight the cultural factors in care for older people, to increase the potential of formal and informal care services, to provide wide and reachable gerontological education and training opportunities for caregivers, families and the older people.

Aims and Scope

"National Association of Social and Applied Gerontology (NASAG)"has recently assumed responsibility for the planning and introduction of a new international journal, namely, the **Journal of Aging and Long-Term Care (JALTC)**. With world societies facing rapid increases in their respective older populations, there is a need for new 21st century visions, practices, cultural sensitivities and evidenced-based policies that assist in balancing the tensions between informal and formal long-term care support and services as well as examining topics about aging.

The **JALTC** is being launched as the official journal of the **NASAG**. The preceding journal aims to foster new scholarship contributions that address theoretical, clinical and practical issues related to aging and long-term care. It is intended that the **JALTC** will be the first and foremost a multidisciplinary and interdisciplinary journal seeking to use research to build quality-based public policies for long-term health care for older people.

It is accepted that aging and long-term care is open to a diverse range of interpretations which in turn creates a differential set of implications for research, policy, and practice. As a consequence, the focus of the journal will be to include the full gamut of health, family, and social services that are available in the home and the wider community to assist those older people who have or are losing the capacity to fully care for themselves. The adoption of a broader view of aging and long-term care allows for a continuum of care support and service systems that include home base family and nursing care, respite day care centers, hospital and hospice care, residential care, and rehabilitation services. It is also crucial to be aware that life circumstances can change suddenly and dramatically resulting in the need for transitional care arrangements requiring responsive, available, accessible, affordable and flexible health care service provision.

For further assistance and more detailed information about the JALTC and the publishing process, please do not hesitate to contact Editor-in-Chief of the JALTC via sending an e-mail: editor-in-chief@jaltc.net
Editor-in-Chief: Emre SENOL-DURAK

N•A•S•A•G
ANTALYA
NATIONAL ASSOCIATION of SOCIAL and APPLIED GERONTOLOGY

Journal of Aging and Long-Term Care