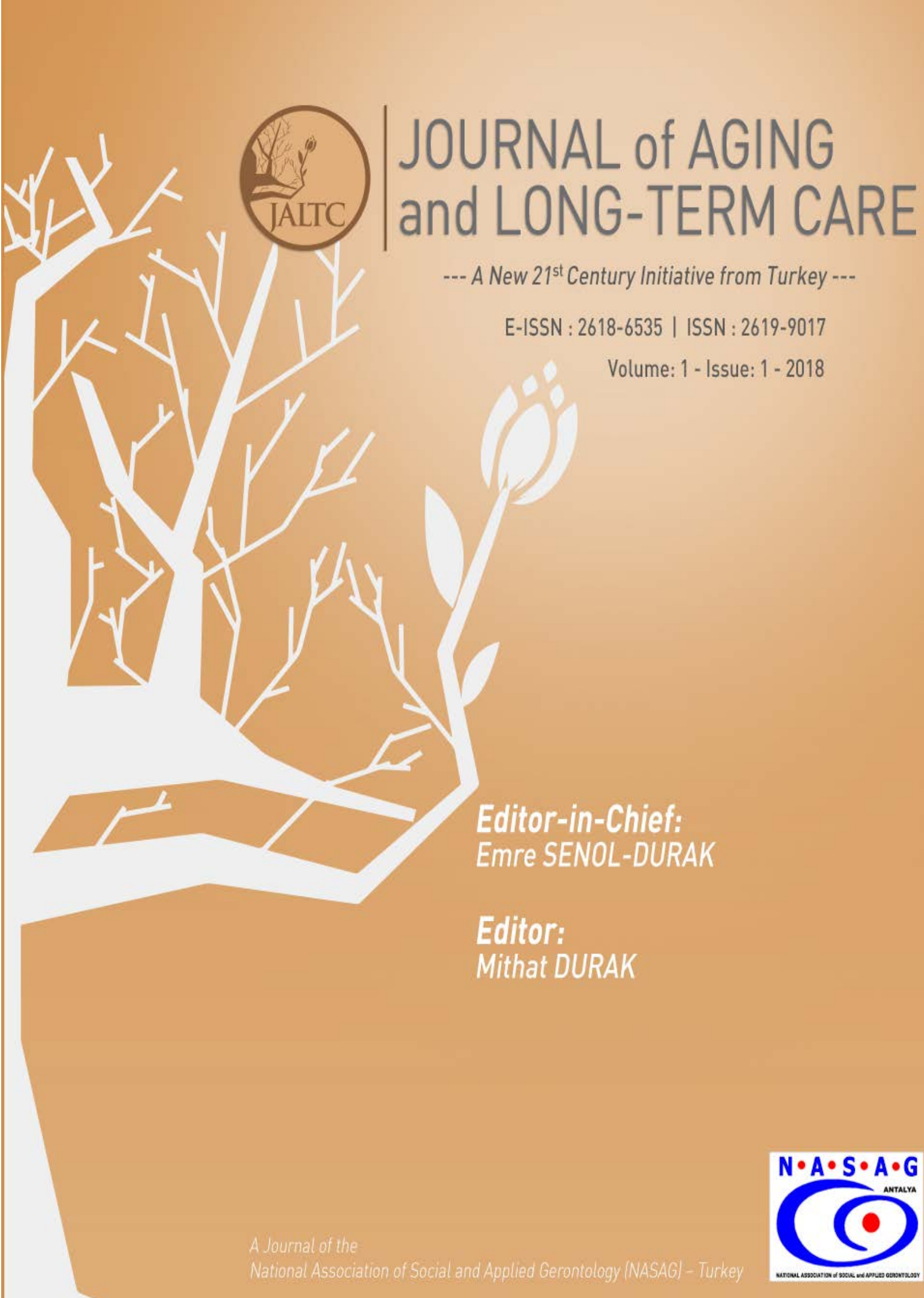

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EDITORIAL

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An Introductory Message from the Editor

Emre Senol-Durak[1]

Welcome to the first edition of a new 21st century Initiative: Journal of Aging and Long-Term Care.

We are most pleased and extremely grateful to announce that through the vision and generosity of Professor. Dr. Ismail Tufan who is currently the Chairperson of the Department of Gerontology at Akdeniz University in Antalya, Turkey that this new journal has been launched through the National Association of Social and Applied Gerontology (NASAG). The Ismail Foundation has assumed responsibility for the initial planning and allied costs associated with the introduction and sustainability of the new journal to be known as 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 examining topics about aging as well as balancing the tensions between informal and formal long-term care support and services. 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 first and foremost a multidisciplinary, interdisciplinary cross-cultural journal seeking to use research to build quality based public policies for long-term health care for older adults.

This international journal represents a genuine commitment to establish a vehicle whereby professionals and practitioners in different aspects of aging and long-term care can access information on a range of research initiatives, intervention strategies, policy developments and philosophical approaches relating to aging and long-term care. We offer the *Journal of Aging and long-term Care* as an important global forum for opening discussion, debate, sharing of research, promotion of innovative ideas, issues and challenges that can assist in developing our understandings and sensitivities surrounding the ethical care of older people made vulnerable by the passage of time. For the first time in human history, increasing numbers of people will live into older age. There is no doubt that the aging of the world's population will significantly affect the overall demand for the provision of aged care services. In the case of the World, the current ratio of the older adult population aged 65 years or over to the rest of the population below the age of 65 years is around 8.4% with the expectation that it will be close to 17% by 2050. Moreover the ratio of oldest-old population aged above 80 years or over is expected to increase three times over during the period 2015 to 2050. Similar trends exist for societies worldwide. The overall improvement in human longevity has expanded the number of older people requiring a diverse range of care and support from either informal or formal caregivers. What we need to comprehend is that while older people have always been part of all societies we now have a situation that highlights the fact that for both the present and the foreseeable future there will be many more older people. Considering the great diversity among the of aged population including the absolute increase in numbers of older people raises the issue of 'scarce resources' along with related issues concerning fairness, availability, affordability and opportunity to access quality aged care. Policy makers and aged care researchers will need to adopt improved levels of cooperation and coordination in order to facilitate the translation of research findings into appropriate policy and strategic planning in order to facilitate the development, implementati-

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on and evaluation of intervention programs and practices. It will be critically important that health care systems along with the diverse range of aged care providers, policy makers and researchers can establish effective pathways to work towards establishing an integrated and sustainable aged care sector to support the growing numbers of older people needing care. It is well to be reminded that aged care sectors worldwide contribute to employment across a large range of occupations with implications for 1) ensuring that appropriate skills and competencies exist among the care workforce 2) the need to meet the challenges arising from existing or likely skills shortages in either direct or indirect care occupations and 3) the need for regular review to ascertain if there exists actions to upgrade skills requirements in the aged care workforce. More than ever, the aged care sector needs to encourage input by way of critical scholarship, and in line with meeting this need we invite contributions from authors from diverse backgrounds and career levels to share their insights, information, perspectives and emerging challenges related to the growing field of aged care services. In launching a new journal we became aware of many challenges not the least of which include:

- Soliciting academic manuscripts from a range of disciplines that offer new ways of thinking about aged care drawing upon both qualitative and quantitative research methods;
- Motivating future contributors to undertake cooperative and collaborative work in the preparation of manuscripts that advance knowledge and understandings surrounding the delivery of aged care services and programs;
- Attracting people to the editorial board who offer multi-disciplinary and /or interdisciplinary experiences in aged care who can professionally assist in the critique of manuscripts submitted for publication;
- Establishing an advisory mechanism to support potential authors who may need assistance to translate their manuscripts into English;
- Encouraging readers worldwide to use *the Journal of Aging and Long-Term* care as a means for enhancing their understandings and knowledge surrounding approaches to the delivery of aged care services and programs within a global context;
- To regularly review the publication process with the view of making meaningful changes that assist authors and the those directly and indirectly engaged in the preparation and completion of each edition of the journal.

Multidisciplinary and interdisciplinary approaches are required to address the emerging challenges facing the field of aged care services and delivery.

Also, it is widely 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 The primary focus of the *Journal of Aging and Long-Term Care* will be to include insights and perspectives that consider and review 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 based family and nursing care, respite day care centers, hospital, palliative 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. Incorporating professional knowledge arising among theorists, scientists, practitioners about long-term care will help to foster a critical analyses aged care systems. Cross-cultural and culture specific applications about long-term care will also help us to clarify common and unique themes about long-term care within specific geographical, regional, national and international contexts..

Serious consideration must be given to the dynamic relationship between the older individual, family and society, understanding bio-psycho-socio-cultural aspects of older adults and their fa-

milies, finding possible solutions for their needs and managing aged care within an ever changing world as an essential part of accepting the moral mandate to nurture and protect human rights. In this respect, buiding and keeping a bridge between scientific and experience-based knowledge surrounding aged care represents a common-sense approach to supporting older adults in need of care.

To incorporate scientific and experience-based knowledge, the *Journal of Aging and Long-Term Care*–marks a timely opportunity to address issues and concerns relating to aging and long-term care. The quantitative, qualitative and mixed-method research approaches are welcome from disciplines including but not limited to education, gerontology, geriatrics, nursing, elderly 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, short communications, and case studies including innovative practices from the field as well as relevant philosophical and ethical perspectives on long-term care and older adults. Implementation of a new 21st century visions, practices, cultural sensitivities and evidenced-based policies will assist in examining topics about aging as well as balancing the tensions between informal and formal long-term care support and services. In essence, this journal offers offers valuable opportunities for examining the status quo of aged care sectors within a global context that can open the way for new approaches and possibilities for introducing care based practices that facilitate positive change. Indeed, the nature of aged care services and delivery will be under constant pressure due to an ever changing mix of demographic, consumer, technological and economic factors. The challenges ahead for the provision of quality based aged care services are enormously complex and varied but not insurmountable. Humane approaches to aging and long-term care will only occur through a combined vision of care that is scientifically grounded in concert with a clearly articulated philosophic and ethical framework that recognizes the changes needed to bring the vision into reality.

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ORIGINAL RESEARCH

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Late-Life Depression in the Older Adults Living in an Institution and at Home

Mithat Durak[1]

Abstract

Psychological well-being in older adults is an important issue in Geropsychology and there is an increasing interest about the older adults living in the community and at home. Understanding markers of well-being associated with either living in an institution or at home would help to explore certain unique variables that make the older adults' life difficult. Among older adults, depression decreases the quality of life and affect the individual's lifespan significantly. However, there have been few studies investigating institution-specific or home-specific markers of depression which are the aims of the current study. The present study aims to make a comparison between 924 the older adults residing in institutions to 846 the older adults residing at home in terms of socio-demographic and health-related variables. Women living at home had higher depression scores than women in the institution. Conversely, men living in institutions were more depressed than living at home while married older adults at home have lower depression scores. Education and income are inversely associated with depression scores. As the number of illnesses increases so does the level of depression. Finally, there is a negative relationship with perceptions of prognosis and perceptions of threat regarding their medical conditions and depression. The interaction of gender, income and residence type is discussed in detail within a cultural context. Possible implications are suggested to improve the psychological well-being of older adults and the specific needs of different populations of older adults based on their residence type are addressed.

Keywords: Older adults, depression, residence type, gender, education, income, marital status, health-related variables, perceptions about illness

Key Practitioners Message

- Investigating the influence of residence type (institution versus home) on the older adults' psychological well-being helps practitioners to understand the psychological effect of environment.
- Examining the association between socio-demographic variables (gender, education, income, marital status) or health-related variables (perceptions of prognosis and threat regarding their medical conditions) and late-life depression reveals individual markers in relation to depression.
- Older adults residing at home are more vulnerable to suffer from depression due to their difficulty in accessing health services and tendency to disregard their health care needs.
- Older adults having physical illnesses had higher scores than their counterparts
- Perceptions regarding the physical illness might be one of the important topics for health care professionals.
- Perceptions about physical illness might be focal point to explore relationship with mental health.

Psycho-social and physical markers in old age make the older adults more vulnerable to suffer from psychological disorders. One of the most commonly examined psychological disorders in the older adults is depression (Panza et al., 2010). Assessing depression in the older adults population is considered important since their physical problems are sometimes part of their psychological well-being (Wetherell & Areán, 1997). Also, depression in these individuals has a specific nature

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and would differ from depression in any other developmental life periods (Rohde, Lewinsohn, Klein, Seeley, & Gau, 2012). In this respect, unlike depression seen in other life periods, geriatric depression is characterized by and expressed as somatic symptoms (Sheehan & Banerjee, 1999), cognitive and neurological symptoms (Steffens & Potter, 2008), and it is more frequent. Despite the frequency of geriatric depression, it is often underestimated by physicians while examining the general health of the older adults. One reason for this underestimation is somatic expressions of geriatric depression constitute a challenging dilemma for physicians (Drayer et al., 2005). Furthermore, symptoms indicating late-life depression are often considered as normal and inevitable results of aging.

Most of the older adults live in the community. The concept of the "late-life" brings institutional care (i.e., rest homes, assisted living and nursing homes) to mind. However, the number of the older adults residing in institutions is likely to be less than the older adults living at home (Kotlikoff & Morris, 1990). Along with such factors as limited beds in institutions and the high cost of institutional care, unwillingness to leave the environment where they live in, there are a lower number of the older adults residing in institutions.

There is an increasing interest about the older adults living in the community and their problems (Hawton et al., 2011). Understanding markers of well-being associated with either living in an institution or at home would help to explore certain unique variables that make life challenging for older adults. Additionally, studies investigating psychological well-being in the older adults are limited in terms of its determinants or limited access to the older adults living at home. Although the majority of the older adults live in their homes, geropsychological studies have generally been conducted with the older adults residing in institutions or receiving treatment in health and/or care facilities. Pragmatically, recruiting data from these samples has advantages in terms of saving resources and time or ease of transportation. However, much published research with the older adults living in an institution might not be generalized to the older adults living at home since factors associated with home or institution are different. In literature, related studies have mostly focused on depression in the older adults living at home, the older adults residing in institutions, or investigated the differences or/and similarities between these two in terms of depression. However, geriatric literature is a lack of studies investigating institution-specific or home-specific markers of depression which are the aims of the current study.

Due to limitations of previous studies mentioned above, comprehensive studies are needed to clarify determinants of depression and to reveal significant implications by means of examining environmental factors, living conditions, physical disabilities or/and psychological patterns must be addressed so as to identify geriatric depression.

Regarding one of the environmental factors related to the late-life depression, the older adults residing in institutions reported more depressive symptoms than the older adults residing at home (Jongenelis et al., 2004). When comparing the prevalence among these two groups, 27.1% of institutionalized the older adults and 9.3% of the older adults living at home had significant depression scores (McDougall, Matthews, Kvaal, Dewey, & Brayne, 2007). Moving into an institution is a difficult decision. When explaining the difference between older adults living at institutions, limited studies focus on other variables such as the satisfaction of place of residence, socio-demographic variables and health status. For instance, among the older adults residing in an institution, participants who were unsatisfied with the institution showed significantly higher depression scores than participants who reported they were satisfied (Hacihasanoglu & Yildirim, 2009). In a study conducted with the older adults residing in institutions, age, gender, marital status, ethnicity, educational level, job, and health status did not significantly correlate with depression (Hughes & Peake, 2002).

Recent studies, in which data were collected from older people at home, revealed several risk factors for geriatric depression. Being a woman (Heun & Hein, 2005; Javed, 2014; van der Wurff et al., 2004; Yaka, Keskinoglu, Ucku, Yener, & Tunca, 2014), lacking a spouse (Javed, 2014; Yaka et al., 2014) or spousal support (Okabayashi, Liang,

Krause, Akiyama, & Sugisawa, 2004), lower income (Rajkumar et al., 2009), having lower levels of education and physical chronic illnesses (van der Wurff et al., 2004) are seen as risk factors of depression. Contradictory findings have been seen in the literature. For instance, there was no significant correlation between gender, age, cognitive impairment and disability status and depression in the older adults residing at home (Rajkumar et al., 2009). On the other hand, health concerns were significantly related to mental concerns. Particularly, older adults having the physical illness are reported to have higher depression scores (Casey, 2012). Also, physically inactive men were at a greater risk for both healthy aging (Blazer, 2005) and geriatric depression (Tanaka, Sasazawa, Suzuki, Nakazawa, & Koyama, 2011).

Depression not only decreases the quality of life but also increases the death rates in a direct or indirect way. Thus, determining all of the risk factors, including the environmental factors as more as possible is crucial to identify and treat depression in the older adults. Referring to the older adults, the place of residence seems to be key to the environmental variables. In this paper, the features of depression in the older adults residing at home or in an institution will be compared. Applying the literature mentioned above, the present study hypothesized the following:

The hypothesis related with residence type:

H1: The older adults residing in the institutions will be more depressive than those residing at the home

The hypotheses related with socio-demographic variables:

H2: Consistent with the literature of gender difference in depression, the women will be more depressive than the men both in the institutions and at the home

H3: There will be a significant difference among the older adults who are university graduated, high school graduated, elementary education graduated, and uneducated both in the institutions and at home; the higher educated older adults reports lower depression scores than lower educated older adults respectively.

H4: There will be a significant difference among the older adults with high levels of income, low levels of income and moderate levels of income both in the institutions and at home; the older adults having higher income reports lower depression scores than lower income respectively.

H5: There will be a significant difference among the older adults who are married, single, divorced, and widowed both in the institutions and at home; married the older adults reports lower depression scores than the other groups while there is no significant difference between the other groups.

The hypotheses related with health-related variables:

H6: There will be a significant difference among the older adults who do not suffer from any medical conditions, suffered from a medical condition, suffered from two medical conditions, and suffered from three or more medical conditions in the institutions and at home; the suffered from more medical conditions reports higher depression scores than lower (or no) medical condition the older adults respectively.

H7: There will be a significant difference among the older adults who perceived prognosis of the medical condition as good, average and bad in the institutions and at home; good reports lower depression than average and bad, average reports lower depression than bad.

Methods

Participants

Data was recruited from 1770 non-cognitive impairment the older adults, 52.2 % residing in institutions (n = 924), 47.8 % residing at home (n = 846). The data were gathered from both urban and rural areas throughout Turkey. Among the participants residing in institutions, 56.4 % was men (n = 521), 43.6 % (n = 403), and at home % 52 was woman (n = 440) and 48 % was men (n = 406). Participant age ranged between 60 and 100 in both groups (M = 76.42, SD = 7.37; M = 70.99, SD = 7.63, for institutions and home, respectively).

Measures

Geriatric Depression Scale (GDS): The GDS (Yesavage et al., 1983) is one of the most widely used methods to evaluate the depression levels of the older adults. GDS is a 30-item questionnaire with a yes/no response format. Subjects are asked items based on how they felt over the past week. Scores ranged between 0-30. The responses were categorized under three groups; such as normal (0-9), mild (10-19) and severe depression (20-30). It was adapted into Turkish culture by Sağduyu (1997) with acceptable levels of psychometric qualities, (i.e. test-retest reliability is .87, internal consistency is .72, sensitivity is .90, and specificity is .97).

The Standardized Mini-Mental State Examination (SMMSE): The SMMSE was developed (Folstein, Folstein, & McHugh, 1975) and standardized (Molloy & Standish, 1997) to assess global neuropsychological functions. It was adopted into Turkish culture for educated and older adults (Gungen, Ertan, Eker, Yasar, & Engin, 2002) uneducated older adults (Keskinoglu et al., 2009). In the present study, the cut-off point for the SMMSE was taken as 24 and participants whose score is below 24 was disregarded.

Demographic information form: Demographic Information Form aimed to obtain information about, gender, education level, income, marital status, place of residence, number of physical illnesses from participants. Also, based on previous studies (Bellizzi & Blank, 2006; Senol-Durak & Ayvasik, 2010), subjects are asked to evaluate perceived health prognosis (1=good 2= average 3= bad) and perception of threat (1= not threatening, 2= moderately threatening, 3= immensely threatening).

Procedure

The older adults residing in institutions were reached with the help of the "Turkish Ministry of Family and Social Policy" and "General Directorate of Social Services and Child Protection (SHCEK)" and the older adults residing at home were reached through the "Turkish Statistical Institute (DIE)". DIE also had an important contribution in data collection by providing a random assignment for the individuals living at home. The addresses of potential participants were provided by the institution. Also, data from the older adults living in institutions who were recommended by SHCEK were collected randomly. The participation was are voluntary and informed consents were obtained from all participants.

Ethical approvals were obtained from both the Human Research Ethics Committee (Abant Izzet Baysal University) and Ankara Clinical Research Ethics Committee (Ministry of Health, General Directorate of Pharmaceuticals and Pharmacy.) The participants were informed about the aim of the study. Data were collected from the older adults by means of face to face interaction after they accepted to participate in the research voluntarily. It took 20-30 minutes to complete the questionnaires. Researchers read questions in order to help the completion of the questionnaires for the less educated older participants.

Results

The prevalence rate of depression based on the residence type

In the present study, data were gathered from 1770 the older adults people; 924 the older adults residing in institutions and 846 the older adults residing at home participated. Among the older adults residing in institutions, based on GDS scores, the frequency of normal, mild and severe depression are 510 (55.19%), 336 (36.36%), and 78 (8.44%) respectively. Among the older adults residing in institutions, based on GDS scores, the frequency of normal, mild and severe depression are 493 (58.27%), 238 (28.13%), and 115 (13.59%) respectively (see Figure-1).

We compare the older adults residing in institutions and residing at home in terms of socio-demographic, health-related, institution-specific, and home-specific variables. For this, the analyses of the independent samples t-test, One-Way

ANOVA and Two-Way ANOVA were performed in order to see the group differences on geriatric depression score.

Residence type and the socio-demographic variables

Residence type: Independent samples t-test were performed to explore whether geriatric depression differs according to residence type. The results demonstrated that depression scores did not differ significantly between two groups of 924 the older adults reside in institutions (M = 9.60, SD = 6.39) and 846 older adults residing at home (M = 9.72, SD = 7.53), $t(1768)$ = -.36, p = .716. Contrary to the expectation that the older adults residing in institutions were more depressed than the older adults residing at home, it seems that the residence type was not an important variable for geriatric depression.

Gender: Independent samples t-test was performed to explore whether geriatric depression differs according to gender. Based on the results, the 440 women at home (M = 11.27, SD = 7.76) were more depressive than the 406 men at home (M = 8.04, SD = 6.90), $t(844)$ = 6.37, p = .001, d = .42, r = .21; as expected, being a woman is a vulnerability factor for depression among the ones residing at home. On the other hand, there were no statistically significant differences between the 403 women residing in institutions (M = 9.84, SD = 6.56) and the 521 men residing in institutions (M = 9.41, SD = 6.25) as determined by Independent samples t-test $t(922)$ = 1.00, p = .317; surprisingly, woman residing in institutions did not report much depression than the men residing in institutions (see Figure-2).

A 2 x 2 Factorial ANOVA was performed to see the main and interaction effects of gender and residence type. The main effect of gender is significant $F(1, 1766)$ = 30.92, p = 001, η^2 = .02. The main effect of residence type was not significant $F(1, 1766)$ = .01, p = .931, The interaction effect of gender and residence type was significant $F(1, 1766)$ = 18.22, p = .001, η^2=.01. In terms of an interaction effect, women at home had higher scores than women in the institution. Conversely, men living in an institution were more depressive than living at home.

Educational level: A one-way analysis of variance (ANOVA) was calculated on depression scores in terms of educational level. The results were significant for home $F(3, 842)$ = 27.46, p = .001, η^2 = .09. According to the Bonferroni post-hoc comparison results the university graduated older adults (M = 7.10, SD = 6.10) and the high school graduated older adults (M = 7.81, SD = 6.78) reported lower depression scores than the elementary education graduated older adults (M = 10.08, SD = 7.53), and the uneducated older adults (M = 13.81, SD = 7.88), while there was no significant differences between the groups of the university graduated older adults and the high school graduated older adults. Moreover, the elementary education graduated the older adults reported lower depression scores than the uneducated the older adults (see Figure-2).

The results were also significant for institutions $F(3, 920)$ = 24.97, $p \leq .001$, η^2 = .08. In institutions, similarly with home, the university graduated older adults (M = 6.41, SD = 5.88) and the high school graduated older adults (M = 8.18, SD = 5.69) reported lower depression scores than the elementary education graduated older adults (M = 9.70, SD = 6.23), and the uneducated older adults (M = 12.13, SD = 6.38). Furthermore, the elementary education graduated older adults reported lower depression scores than the uneducated older adults (see Figure-2). There were no significant difference between the university graduated older adults and the high school graduated the older adults.

A 4 x 2 Factorial ANOVA was performed to see the main and interaction effects of education and residence type. The main effect of education was significant $F(3, 1762)$ = 52.72, p = 001, η^2 = .08. However, the main effect of residence type was not significant $F(1, 1762)$ = 2.95, p = .086, The interaction effect of education and residence type was also not significant $F(3, 1762)$ = 1.42, p = .235.

Income: A one-way analysis of variance (ANOVA) was performed on depression scores in terms of

monthly income level. The results were significant for home $F(2, 786) = 6.56$, $p = .001$, $\eta^2 = .02$. According to the Bonferroni post-hoc comparison results the older adults with high levels of income ($M = 8.80$, $SD = 7.72$) reported lower depression scores than the older adults with low levels of income ($M = 11.25$, $SD = 7.25$). On the other hand, there were no significant differences between the older adults with low levels of income and the older adults with moderate levels of income ($M = 9.85$, $SD = 7.07$), and the older adults with moderate levels of income and the older adults with high levels of income (see Figure-2).

The results were also significant for institutions $F(2, 827) = 20.17$, $p = .001$, $\eta^2 = .05$. In institutions, the older adults with high levels of income ($M = 7.09$, $SD = 5.85$) and the older adults with moderate levels of income ($M = 9.09$, $SD = 6.09$) reported lower depression scores than the older adults with low levels of income ($M = 10.87$, $SD = 6.58$), and the older adults with high levels of income reported lower depression scores than the older adults with moderate levels of income (see Figure-2). Therefore, increased levels of income were seen to be associated with decreased levels of depression.

Marital Status: A one-way analysis of variance (ANOVA) was performed on depression scores in terms of marital status. The results were significant for home $F(3, 842) = 14.50$, $p = .001$, $\eta^2 = .05$. According to the Bonferroni post-hoc comparison results, at home, the married older adults ($M = 8.48$, $SD = 7.07$) reported lower depression scores than the single ($M = 10.32$, $SD = 8.09$), the divorced ($M = 11.71$, $SD = 7.76$), and the widowed ($M = 12.07$, $SD = 7.82$) the older adults. Moreover, there was no significant difference between single, divorced, and widowed older adults in terms of depression scores (see Figure-2).

The results were also significant for institutions $F(3, 920) = 9.49$, $p = .001$, $\eta^2 = .03$. According to the Bonferroni post-hoc comparison results, the married ($M = 7.80$, $SD = 5.98$) and the divorced ($M = 8.71$, $SD = 6.22$) older adults reported lower depression scores than the widowed older adults ($M = 10.57$, $SD = 6.47$), while there were no significant difference between the married, the divorced, and the single ($M = 9.77$, $SD = 6.13$) older adults. In addition, there also were no significant difference between the single and the widowed older adults (see Figure-2).

A 4 x 2 Factorial ANOVA was performed to see the main and interaction effects of marital status and residence type. The main effect of marital status was significant $F(3, 1762) = 20.66$, $p = 001$, $\eta^2 = .03$. The main effect of residence type was also significant $F(1, 1762) = 6.72$, $p = .010$, $\eta^2 = .01$. However, the interaction effect of marital status and residence type was not significant $F(3, 1762) = 1.06$, $p = .365$,

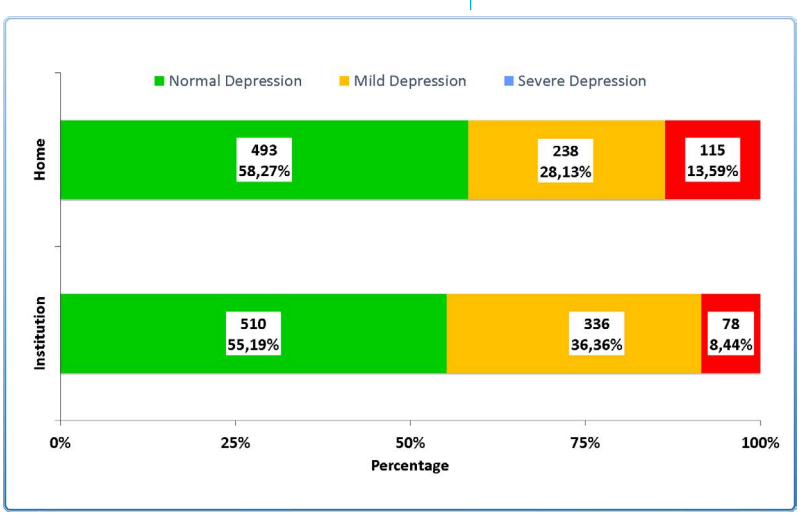

Figure-1: The prevalence rate of depression based on the residance type

Health-related variables

The number of medical illnesses: A one-way analysis of variance (ANOVA) was performed on depression scores in terms of the number of medical illnesses. The results were significant for the older adults residing at home $F(3, 842) = 30.21$, $p \leq .001$, $\eta^2 = 0.10$. According to the Bonferroni post-hoc comparison results, the older adults who did not suffer from any medical illnesses ($M = 6.44$, $SD = 6.25$) reported lower depression scores than the older adults suffered from a medical illness ($M = 9.93$, $SD = 7.45$), the older adults suffered from two medical illnesses ($M = 12.25$, $SD = 7.45$), and the older adults suffered from three or more medical illnesses ($M = 16.48$, $SD = 7.25$). Moreover, the older adults suffered from a medical illness reported lower depression scores than the older adults suffered from two medical illnesses, and the older adults suffered from three or more medical illnesses; the older adults suffered from two medical illnesses reported lower depression scores than the older adults suffered from three or more medical illnesses (see Figure-2). Therefore, the increased number of medical illnesses increased the depression scores at home.

The results were also significant for institutions $F(3, 920) = 10.52$, $p \leq .001$, $\eta^2 = .04$. In institutions, the older adults who did not suffer from any medical illnesses ($M = 7.95$, $SD = 5.38$) reported lower depression scores than the older adults suffered from a medical illness ($M = 9.44$, $SD = 6.39$), two medical illnesses ($M = 11.23$, $SD = 6.50$), and three or more medical illnesses ($M = 12.16$, $SD = 7.67$). Furthermore, the older adults who suffered from a medical illness reported lower depression scores than the older adults who suffered from two medical illnesses and three or more medical illnesses. On the other hand, there were no significant differences between the older adults who suffered from two medical illnesses and three or more medical illnesses (see Figure-2).

A 4 x 2 Factorial ANOVA was performed to see the main and interaction effects of number of medical illnesses and residence type. The main effect of number of medical illnesses was significant $F(3, 1762) = 39.43$, $p = 001$, $\eta^2 = .06$. The main effect of residence type was significant $F(1, 1762) = 5.06$, $p = .025$, $\eta^2 = .00$. The interaction effect of a number of medical illnesses and residence type was significant $F(3, 1762) = 4.91$, $p = .002$, $\eta^2 = .01$. Addition to the group comparisons explained above, in terms of no illness and 1 illness condition the older adults at home was less depressive than the older adults in institutions, however, in terms of 2 illnesses and 3 or more illnesses condition the older adults at home was more depressive than the older adults in institutions.

Perceived prognosis of the general medical condition: A one-way analysis of variance (ANOVA) was performed on depression scores in terms of perceived prognosis of the general medical condition. The results were significant for the older adults residing at home $F(2, 634) = 102.55$, $p \leq .001$, $\eta^2 = 0.26$. According to the Bonferroni post-hoc comparison results, the older adults perceived the general medical condition as good ($M = 7.12$, $SD = 5.39$) reported lower depression scores than the older adults perceived as average (sometimes good and sometimes bad) ($M = 12.02$, $SD = 7.26$), and the older adults perceived as bad ($M = 18.90$, $SD = 7.65$). In addition, the older adults perceived the medical condition as average reported lower depression scores than the older adults perceived as bad (see Figure-2).

The results were similar with home for institutions in term of significance $F(2, 737) = 45.83$, $p \leq .001$, $\eta^2 = 0.13$, and the comparisons. The older adults perceived the general medical condition as good ($M = 7.88$, $SD = 5.87$) reported lower depression scores than the older adults perceived as average ($M = 10.34$, $SD = 5.98$), and the older adults perceived as bad ($M = 14.23$, $SD = 6.93$). Furthermore, the older adults perceived the general medical condition as average reported lower depression scores than the older adults perceived as bad (see Figure-2).

A 3 x 2 Factorial ANOVA was performed to see the main and interaction effects of perceived prognosis of the general medical condition and residence type. The main effect of perceived prognosis of

the general medical condition was significant $F(2, 1371) = 148.77$, $p = 001$, $\eta^2 = .18$. The main effect of residence type was significant $F(1, 1371) = 23.14$, $p = .001$, $\eta^2 = .02$. The interaction effect of perceived prognosis of the general medical condition and residence type was significant $F(2, 1371) = 16.38$, $p = .001$, $\eta^2 = .02$. Addition to the group comparisons explained above, in terms of perceiving the prognosis of the general medical condition as bad and average, the older adults at home was more depressive than the older adults in institutions, however, in terms of perceiving the prognosis of the general medical condition as good, the older adults at home was less depressive than the older adults in institutions.

Perceived dangerousness of the general medical condition: A one-way analysis of variance (ANOVA) was performed on depression scores in terms of perceived dangerousness of the general medical condition. The results were significant for the older adults residing at home $F(2, 588) = 39.17$, $p \leq .001$, $\eta^2 = 0.12$. According to the Bonferroni post-hoc comparison results, the older adults perceived the general medical condition as not life-threatening at all ($M = 8.48$, $SD = 6.17$) reported lower depression scores than the older adults perceived as moderately life-threatening ($M = 12.54$, $SD = 7.66$), and the older adults perceived as immensely life-threatening ($M = 14.96$, $SD = 8.99$). Moreover, the older adults perceived the general medical condition as moderately life-threatening reported lower depression scores than the older adults perceived as immensely life-threatening (see Figure-2).

The results were also significant for institutions $F(2, 657) = 6.06$, $p \leq .01$, $\eta^2 = .02$. In institutions, the older adults perceived the general medical condition as not life-threatening at all ($M = 9.23$, $SD = 6.47$) reported lower depression scores than the older adults perceived as immensely life-threatening ($M = 11.19$, $SD = 6.77$). On the other hand, there was no significant difference between the older adults perceived the general medical condition as not life-threatening at all, and the older adults perceived as moderately life-threatening ($M = 10.72$, $SD = 6.35$); and between the older adults perceived the general medical condition as moderately life-threatening and the older adults perceived as immensely life-threatening (see Figure-2).

A 3 x 2 Factorial ANOVA was performed to see the main and interaction effects of perceived dangerousness of the general medical condition and residence type. The main effect of perceived dangerousness of the general medical condition was significant $F(2, 1245) = 41.74$, $p = 001$, $\eta^2 = .06$. The main effect of residence type was significant $F(1, 1245) = 14.43$, $p = .001$, $\eta^2 = .01$. The interaction effect of perceived dangerousness of the general medical condition and residence type was significant $F(2, 1245) = 11.27$, $p = .001$, $\eta^2 = .02$.

Discussion

The present study aims to examine the influence of residence type on the older adults' psychological well-being measured by the Geriatric Depression Scale. The comparison was made between 924 the older adults residing in institutions to 846 the older adults residing at home in terms of socio-demographic variables and health-related variables. The data were analyzed by independent samples t-test, One-Way ANOVA and Two-Way ANOVA.

In the present study, prevalence rates of "no depression" seems to be similar regardless of residence type. However, severe depression was higher among the older adults who live at home than those living in an institution, and mild depression was higher among the older adults who live in institutions than those living at home. Interestingly, the older adults residing at home were more vulnerable to suffer from severe depression, which might be due to their difficulty in accessing health services and tendency to disregard their health needs. Moreover, in the case of a medical emergency, older adults residing in institutions can access to immediate health care which might increase their sense of safety regarding their medical conditions. If treatment opportunities are available, the effect of life challenges can be decreased for the older adults residing at home or in an institution. Therefore, special attention to early and continuous diagnosis or assessment of depression seems to be crucial for the older adults.

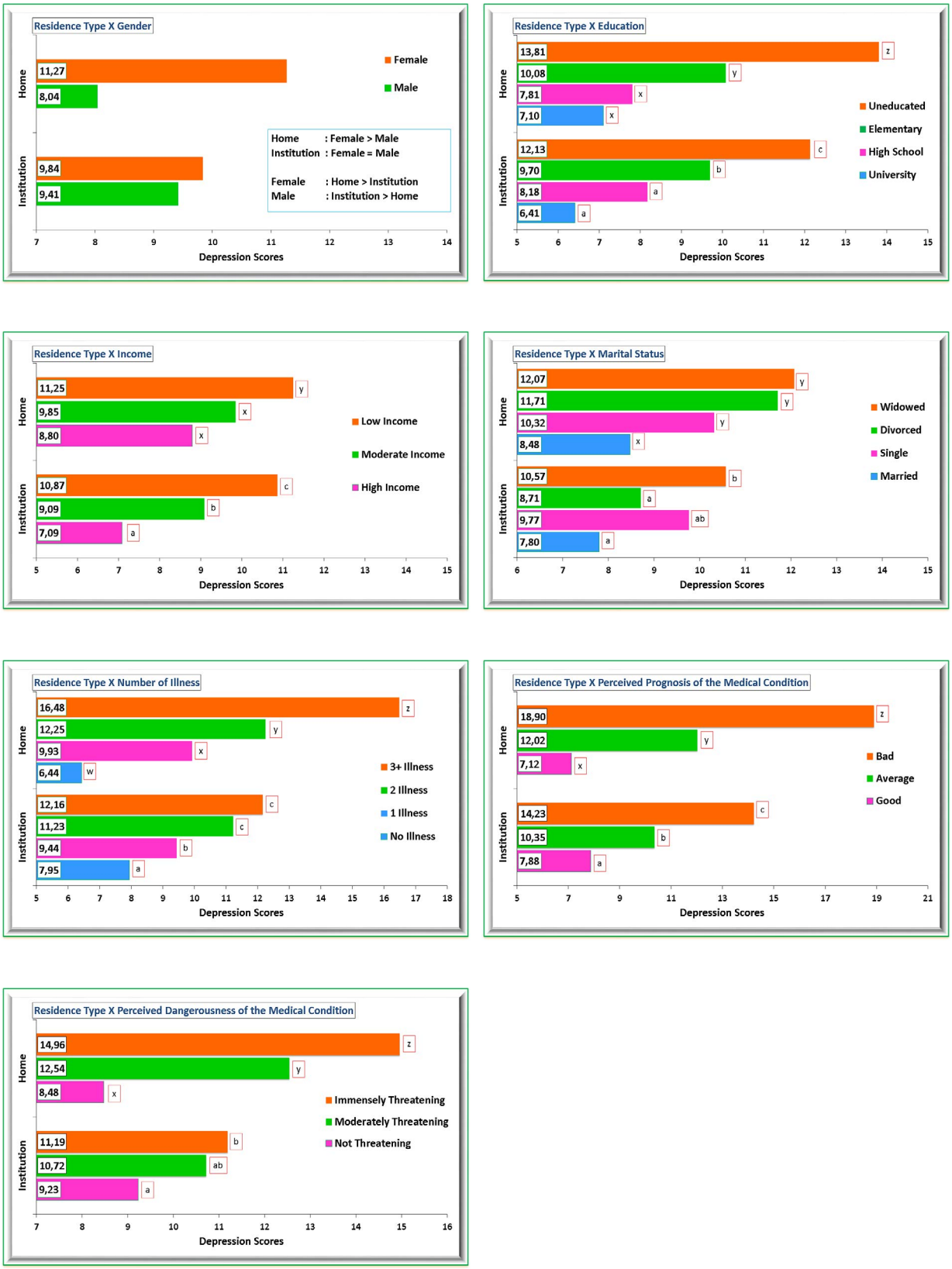

Figure-2: Group differences in depression scores

Based on the residence type, there was not any significant difference between the older adults residing in an institution versus at home. On the other hand, the differences between the categories of the general characteristics and the residence-specific factors in terms of geriatric depression should be investigated in future studies.

In terms of gender-based comparison, in institutions, there was no significant difference among gender groups. On the other hand, the results of the current study contradict a finding in an earlier study. Jongenelis and his colleagues (2004) found that the older women were more vulnerable than the older men to suffer from depression while residing in an institution. However, women had significantly higher depression scores than men at home.

Also, gender by residence type interaction was significant. Women at home had higher scores than women in the institution. The fact that older women living at home were more depressive can be explained by the responsibilities and duties they have. In Turkish culture, regardless of their age, women are expected to do daily chores (cooking, cleaning, etc.). Due to physical changes related to aging, women might not feel competent enough in managing the daily chores. Moreover, they are responsible for maintaining the wellbeing of their family members at all levels and they prefer to be socializing at their homes. In the institution, women have smaller responsibilities which might influence their lower depression scores and they have a larger social network than they are at home.

Also, remarkably, men living in institutions were more depressed than those living at home. This interesting finding can be attributed to gender-oriented social norms and expectations. The reason for older men to be more depressed in institutions is that they feel more restricted there. They have less opportunity to socialize outside the institution and to do physical activities when compared to men living at home. Older men are not expected either to work outside or to do daily chores at home, so they have too much spare time. They prefer setting their social network outside their home. However, in the present study, likewise mentioned in some studies (Chen, 2010), the older adults living in institutions feel that they have restricted lifestyle as enough physical activity is not part of their lifestyles which might in turn influence their depressive symptoms. Therefore, as suggested (Chen, 2010), setting physical activity for those men are crucial for intervention. It is highlighted that these activities might be planned in institutions. However, when considering Turkish men's lifestyles, the activities planned outside the institutions might be more useful especially for men.

The education level attained by the older adults is a contributing factor for geriatric depression. For example, those who achieved at least a high school diploma had lower levels of depression than those with less education. These findings are similar to previous findings in the literature which show that the less educated the older adults, the more depressive they tend to be (van der Wurff et al., 2004). These findings suggest that the older adults who have at least a high school diploma may be more knowledgeable and willing to access the health care services and/or they might have better coping skills to deal with difficulties during the transitions in life. Their awareness regarding their psychological well-being might also be higher which can lead them to seek professional help. When considering education by residence type interaction, only education effect was significant. This finding demonstrates that education is an important factor on the late-life depression.

A relationship between income levels and depression was also found to be significant according to residence type when three income levels (high, moderate, low) were categorized by means of a range of income. When the older adults lived at home, just two of three groups results significantly differed from each other. High-income levels experienced less depression while those with low-income levels experienced higher levels of depression. Similar results were obtained in other studies as well (Rajkumar et al., 2009). However, in the sample of older adults living in institutions, the differences among older adults reporting higher, moderate and lower income levels were significant based on their depression scores. The higher the income, the lower the depression scores among those living in institutions. For in Turkish institutions, higher income level is related to receiving more services and better living conditions (i.e., living alone or in a shared room, having their personal TV, radio,

computer, etc.). Therefore, the difference in their depression levels might be related to these factors.

In terms of marital status, being married and living at home appear to be a protective factor against depression, a finding that has been noted in previous research. This is probably due to spouses receiving support from each other (Okabayashi et al., 2004). As a group, those who are single, widowed or divorced and living at home show higher rates of depression compared to married counterparts. For the older adults residing in institutions, being widowed could contribute to higher levels of depression. Since widowed individuals have lost his/her spouse and the literature shows that loss is a contributory factor to depression (Costello, 1972), it is no surprise that their depression levels are higher than those with other marital statuses.

In terms of medical conditions, both the older adults living at home and in institutions with the presence of physical illnesses had higher scores than their counterparts. Similar findings were seen in the literature (van der Wurff et al., 2004). Since loss is a part of depression, this result can be interpreted as the perceived loss over their health. On the other hand, the results were different when looking at the effect of the number of physical illnesses that the older adults had. The older adults having three or more physical illnesses and living at home had higher scores of depression than those having two or fewer illnesses or none at all. These results might be due to the illnesses restricting the older adults' life and sense of control over their health. Providing professional support to these older adults living at home is crucial to helping them manage their health problems. Surprisingly, in institutions, the older adults having two illnesses had significantly higher depression scores than all other older adults individuals, including those with fewer and more illnesses. Additional illnesses might overwhelm them for which they have to be under regular medical control and it could also symbolize to be in the process of aging. Those having three or more illnesses may receive constant care and they know more how they control over diseases. Those having fewer illnesses or none at all were very close to each other in terms of depression scores which might be due to a sense of control over their health in the institution.

A relationship between perceived prognosis levels and depression was also found to be significant when three groups of perceived prognosis (good, average, bad) were examined. It is found that, when the older adults evaluated their health as bad, their depression scores were significantly higher than those evaluating their health as "good" or "average" in both at home and in institution conditions. Moreover, the older adults perceiving their health as "bad" at home condition had higher scores than those living in the institution.. Also, a relationship between perceived dangerousness levels and depression was also found to be significant when three groups of perceived dangerousness (none, moderately, immensely threatening) were examined. In both at home and in institution conditions, the older adults who reported their illnesses as "immensely threatening" had higher depression scores than who reported them as "moderately threatening" or "none threatening". Also, at home condition, the older adults perceiving their "immensely threatening" had higher scores of depression than those living in an institution. This result shows that perceptions regarding the physical illness might be one of the important topics for health care professionals and might be a focal point to explore a relationship with mental health. Similar results were obtained in other studies as well (Bellizzi & Blank, 2006; Denkinger, Lukas, Herbolsheimer, & Nikolaus, 2012; Panza et al., 2010; Senol-Durak & Ayvasik, 2010). The self-rated health status was found to influence health-care utilization (Denkinger et al., 2012). Therefore, perception about illnesses is important when helping their well-being.

The present study design is cross-sectional therefore, results did not reveal causality. Also, interpretations about Turkish older adults might not be generalizable to other older adults populations. Other variables helping to explore late-life depression such as functional status physical performance and activity, physical distress, time since from retirement, relationship difficulties (Lindner, Foerster, & von Renteln-Kruse, 2014), number of individuals living with are needed to be examined in future studies while explaining possible correlates of the late-life depression.

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BOOK REVIEW

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Where Memories Go: Why Dementia Changes Everything

by Sally Mangusson, Two Roads, London, 2014, 408 pp, ISBN 978-1-444-75181-9

Ilksen Oben Erucar[1]

The world is aging and so is humanity. According to National Institute on Aging, by 2050, the number of people aged 65 or older will have tripled to almost 1.5 billion, representing 16 percent of the world's population (Suzman & Beard, 2015). This rapid increase in the number of the elderly throughout the world has brought *elderly care*, fulfillment of the special needs and requirements unique to senior citizens, and *residential care*, long-term care provided in a residential setting as opposed to family home, into the agenda of health systems and increases in dementia cases has made it an imperative to include dementia in elderly and residential care as a global health challenge.

Dementia is a general term that describes the set of symptoms including memory loss and difficulties with language, thinking, behavior and problem solving to a degree that may interfere with daily tasks, social life or work (Alzheimer's Society, 2017). The number of people with dementia is steadily increasing in the world, mostly affecting people over 65 and research shows the need for careful planning to ensure that best care and support is given to the large part of the population that will require it one day.

Dementia causes personality changes. It creates confusion, apathy and withdrawal (Laputz, 2017). The memory loss that accompanies it is progressive and it will leave the affected ones devoid of their cherished memories soon. Dementia can erase the memories of our loved ones, but it will not erase the memories that our loved ones leave us!

Sally Mangusson's acclaimed book "*Where Memories Go: Why Dementia Changes Everything*" is both a memoir and a manifesto on caring for people with dementia. A broadcaster and author by profession, Magnusson calls this work "the biggest story of her life." Max Pemberton of Telegraph writes "This book should be compulsory reading for every doctor and nurse."

In the book, Sally Mangusson talks about dementia, one of the greatest challenges of our times, the curse of 21st century, the loss of one's memories and the descent into oblivion and as she states, this can only be managed by poets sometimes:

> "The brain's black holes into which memories have fallen" (Dementia, Mcintyre, Lorn, as cited in Mangusson, 2014, p. 91).

Taking care of her mother with dementia with the help of her two sisters, the author experiences a whole range of feelings and she learns about and reflects on available care options for dementia. Watching a mother who has cherished words all her life only to lose them one by one along with her memories has given the author the lead to do research in the field and she shares this information in the book in a most endearing manner, mixing the facts with feelings, the history of dementia with anecdotes and her mothers' track oh health with useful advice for practitioners. She cites the new developments in gerontology and dementia care as well as residential care, gives information about latest research on the link between dementia and genetics, talks about integrated, multi-disciplinary and small scale community models care models and cites researchers, provides information on local and global initiatives, new kinds of residential care that have been tried, cites commission reports on dementia care and includes interesting results which emphasize that the current situation cannot continue, but she has shown in the book that it unfortunately does.

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Magnusson also introduces a new method that will help people with dementia to connect with their past more easily, at times of frustration and loss. She has successfully used this playlist method in which people with dementia are provided with a playlist of personally meaningful music from their past lives. With her charity *Playlist for Life* (Metcalfe et al., 2017) she continues to encourage the use of music to ensure people with dementia, an anchor to hold on to when the grey matter of the brain is more clouded and the skies turn blacker. Testimonies on the *Playlist for Life* website and the Facebook page talks about joy when music restores language for a while, brings the liveliness in people with dementia "as if a light bulb has been switched on again".

The memoir takes us on a journey of love and life as well as loss and death. Losing a loved one to an insidious disease and her becoming a completely new person who has forgotten many things about you, her life; her cherished memories is heart rending but this makes the book inspiring for others who will surely walk this path. The book gives us facts and ideas as well as hope for future developments in care for people with dementia.

Dementia takes the memories of our loved ones, one by one, and carries them to places unknown and uncomfortable. But it does not take ours. Hence, it is in our hands to ensure they are given the best care, with dignity, with respect and most importantly, with love.

Today, the statistics and research report that support is necessary for people with dementia and methods that will provide them with better care, with dignity and respect are essential.

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Older Adults' Education and Its Relation to Quality of Life: An Italian Example

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Abstract

Quality of Life (QoL) is a relevant topic for researchers and social policy makers developing educational programs for older adults. Such programs might be aimed at maintaining people's wellbeing: in fact, when retired, people have more time for activities that may increase their satisfaction in the moment of adaptation to old age. In this perspective, the Universities of the Third Age (UTAs) offer leisure, educational and social activities. The present study was carried out at the *Libera Università della Terza Età* (LUTE) in the town of Milazzo, Southern Italy, with the objective to evaluate the QoL for the people enrolled and the factors contributing to make such initiative successful. Participants to the study (n = 340) were required to fill a questionnaire asking their generalities and information about the educational initiatives followed. QoL was assessed through the administration of the WHOQoL Bref. The relationship between QoL, socio economic variables and the items of the WHOQoL Bref was tested through the estimation of an ordered logit model. Instead, the individuals' experiences at the LUTE were the focus of a correlation analysis, that considered specifically the level of satisfaction for the activities performed. The relevance of the results may be appreciated considering that the courses and educational initiatives can count on the contribution offered by volunteers. Hence, a positive outcome in terms of QoL is obtained at null or very low costs. Overall, educational initiatives directed to older adults should be actively promoted, given their implications, both from a social and economic perspective.

Keywords: Quality of Life (QoL), adult education, educational and leisure activities, social participation, Universities of the Third Age (UTAs)

Key Practitioners Message

- The opportunity to attend and to take part of educational and leisure activities may increase individual QoL especially for the older adults.
- People joining institutions such as the Universities of the Third Age (UTAs) may be involved in the activities organized by the UTAs both as learners, lecturers and volunteers helping in the course management.
- In the case study examined, a positive outcome in terms of quality of life is obtained at very low costs, since the institution relies on the contribution offered by volunteers.

In the last decades there has been a growing interest towards the concept of Quality of Life (QoL) in many areas of research, such as psychology, sociology, economics, philosophy, etc. (Barcaccia et al., 2013).

The issue of guaranteeing a high QoL must be coupled with social changes occurring in many industrialized countries: the population is gradually aging and this circumstance has economic implications in terms of health expenditure and long term care, that is often required (Brenna & Gitto, 2017). At the end of 2015, people aged 65 or older accounted for more than 20% of the total population in three countries: Germany, Italy and

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Japan. This figure is expected to rise from three to thirteen countries by 2020, and to thirty-four countries by 2013 (Borji, 2016).

A small increase of life expectancy generates a significant higher total health expenditure per capita. Since the latter might grow faster than Gross Domestic Product (GDP) per capita, the share of health expenditures to GDP is also expected to increase (Grammenos, 2005). However, if appropriate measures are implemented in time, population ageing may not inevitably lead to significantly higher health care expenditure (Rechel, Doyle, Grundy & McKee, 2009).

In order to reduce the burden due to increasingly ageing population, the approach of active ageing, that concerns health promotion, personal commitment and social activities, should be adopted and *ad hoc* programs implemented.

A successful active aging includes three main components: first of all, there is a low probability of disease and disease-related disability; then, older adults have a high cognitive and physical functional capacity, compared with people aging in a passive way; finally, the third aspect is represented by an active engagement with life. All the three terms are related to each other and the relationship among them is, to some extent, hierarchical. While the absence of disease and the maintenance of functional capacities characterize successful aging, it is their combination with active engagement that fully represents the concept (Rowe & Khan, 1997).

Successful aging is associated to formal and informal social activities for the older adults (Huxhold, Fiori & Windsor, 2013). The analysis of social activities performed by the adult population is of interest for social policy makers developing programs aimed at maintaining people's satisfaction and happiness.

The effects of such activities on life satisfaction, as an indicator of the overall QoL, health and social integration (Wahrendorf & Siegrist 2010) are treated in those studies examining the effects of carrying out activities at all ages. In particular, during old age, the strategy that sees the adaptation to aging is associated to higher levels of involvement in social and leisure activities (Adams, Leibbrandt & Moon, 2011; Janke, Payne, & Van Puymbroeck, 2008). Personal factors, such as people's health and behavioral abilities, together with the circumstance of being occupied are crucial in maintaining a good level of QoL (Levasseur, St-Cyr Tribble, & Desrosiers, 2009).

Through participation in leisure activities, people can build social relationships, feel positive emotions, acquire additional skills and knowledge (Brajša-Žganec, Merkaš & Šverko, 2010; Escuder Mollon & Cabedo, 2014, p. 10). It has been demonstrated that, at any age, isolation can cause undesirable negative consequences, such as irrational thoughts or disturbed behavior. Hence, individuals need to share activities with the other people around them (National Institute of Aging, 2015).

In particular, undertaking educational tasks and other activities is seen as a way of staying young. While learning is interpreted as something that young people did for their future, the scenario is modified in adult age. In fact, when retired, adults have more time for other activities apart from work (Nimrod, 2007), and these activities may help them in adapting to old age (Adams, Leibbrandt, & Moon, 2011; Santos, Pavarini, Brigola, Souza Orlandi, & Inouye, 2014).

Older adults or retired people are willing to learn for various reasons: they may want to increase their knowledge about a given subject; to know more about the place where they live and its history; to understand modern society; to avoid exclusion; to remain active and creative. In this context, the term "adult learner", describes any adult who is involved in a systematic learning process, be it formal or informal. The adult learner is autonomous and has already accumulated a vast knowledge through his/her own experiences of life. Learners' opinions, values and beliefs are their defining characteristics, transferred to the learning situations (Kapur, 2015). The adult learners consider themselves as main actors of their own learning: they attend classes because they want to and are, therefore, the first ones to be interested in receiving high quality education.

In this perspective, in the last 30-40 years the Universities of the Third Age (UTAs) have developed in many industrialized countries (Formosa, 2014). The UTAs have been described both as an idea and a "movement", as each institution has a local foundation and relatively unique features. Whilst some UTAs are connected to traditional universities, others are autonomous and their activities depend on the volunteers' efforts.

Various studies outline how these institutions bring about direct health benefits for their members (Sonati, Modeneze, Vilarta, Maciel, Boccaletto, & da Silva, 2011). However, at present, there is no rigorous research investigating the relationship between UTAs membership, on the one hand, and improvement in physical and cognitive wellbeing, on the other hand: rather, there are many studies showing how continued mental stimulation in later life helps learners to maintain their physical and cognitive health status (Cohen, 2006).

The literature on the topic often refers to single case studies: a study of leisure and free time activities in a sample of adult population carried out in Spain (Lardies-Bosque et al., 2015) confirm the positive effects of active ageing. Other studies have been carried out within European projects (Zielinska-Wieczkowska, Kedziora-Kornatowska, & Ciemnoczolowski, 2011; Escuder-Mollon & Cabedo, 2014).

In Italy the majority of informal courses and educational activities is offered to the aging population by the UTAs and, to a minor extent, by voluntary organizations. Some of the UTAs are organized on a national scale and associated with some networks, as, for example, *Federuni* (that counts about 250 senior universities in Italy) or the *Associazione per l'AUtogestione dei SERvizi e la solidarietà* (AUSER), the national older people organization. Although the UTAs are, by definition, directed specifically at senior citizens, they are open to people of all ages (Principi & Lamura, 2009).

The present paper is aimed at discussing these issues, looking at a successful case study in Southern Italy: although the identification of a causal relationship among the attendance to social and educational activities and the improvement in the reported QoL is not the purpose of this paper, some considerations of the positive impact on attending UTAs on healthy ageing arise from the study and call for further deepening in this direction.

Despite their limitations, the results obtained by observing a single reality underline the positive effects of learning in adulthood, confirm some insights of the literature and emphasize the critical aspects to take into account at the organizational level.

Methods

The study was designed as a cross-sectional and was aimed at evaluating the QoL for the individuals enrolled in the *Libera Università per la Terza Età* (LUTE) in Milazzo, Sicily, Italy. The LUTE was established in 2011 and adheres to the AUSER, the Italian association for active aging. It organizes its activities exclusively on the basis of volunteers' work. In 2016, the people involved in its activities, attending the courses, being lecturers or working as volunteers in the management of the courses were about nine hundreds.

The number of courses offered is currently more than one hundred, covering different thematic areas. Together with taught classes, it is possible to join other activities (going to the theatre, attending conferences, joining guided tours, etc.). The possibility to attend the courses is free of charge for all members: it is due only an annual membership fee of € 30.00.

Participants

The analysis has been carried out in the period February-May 2016. People participating to the survey were asked to fill a questionnaire made of two parts: the first part contained individuals' general information, together with information related to the educational initiatives and to the courses attended. The second part of the questionnaire included the WHOQoL Bref (World Health Organization Quality of Life Bref) to measure QoL.

The sample considered in the present analysis was constituted by the respondents to the survey.

Overall, 340 people answered the questionnaire, although not all of them completed the whole form. They were 63 years old on average: the age in the sample ranged from 26 to 95 years, even if the majority (53%) of the people were older than 65 years.

The most of the respondents was female (71.47%); 64.12% was married and almost 89% lived with the family or with the partner; about 11% declared to live alone. Fifty seven per cent of the participants completed the high school; 17.35% had an academic education.

The majority of the participants to the survey (54.41%) stated that they had been motivated to enroll to the LUTE by their own interests (alone) or publicity campaigns; 30.59% answered that they decided to attend the LUTE because a colleague or friend had talked to them about it. The remaining 11.18% followed their relatives' advice (for descriptive results see Table-1).

Some items in the questionnaire related to the satisfaction from attending the LUTE. More than 86% of the enrolled people, were satisfied with their choice, and almost one fifth of them declared a high level of satisfaction. Only few remarks were made with reference to certain aspects inherent to the course organization: given the high number of courses, some of them overlapped; this circumstance obliged some people to renounce to attend some classes. Other courses, facing a high request, were overcrowded: as a consequence, too large classes negatively affected the quality of teaching and the learners' achievement, and this might have determined an overall lower satisfaction from their attendance.

Regarding the most appreciated aspects of the LUTE activities, there were the possibility to socialize (67.65%), the number of courses offered (almost 58%), the variety of the organized activities, that includes attendance to concerts, theatre performances, guided tours, etc. (27.94%); almost one fifth of the people in the sample appreciated the motivation by the people who voluntarily collaborate in the organization and management of the courses. In fact, although the people joining the LUTE enroll, first of all, with the aim of attending the courses and the other activities (80.29%), 11.18% of the people who participated to the survey works as volunteer and, among them, 4.11% has the double role of learner and volunteer within the organization.

From the data collected, it was clear that people performed different activities at the LUTE. Looking at the proportion of hours spent at the LUTE only as learner or volunteer, it emerged that attendance to classes required the greatest number of hours (83.80%) comparing to the number of hours dedicated to organizational tasks as volunteer.

Measures

The WHOQoL 100: This measure was developed by the WHOQoL Group with fifteen international centers, simultaneously, with the aim to obtain a QoL assessment that could be cross-culturally applicable (Orley & Kuyken, 1994; Szabo, 1996; WHOQOL Group 1994a, 1994b, 1998). Since the WHOQoL 100 was too long for practical use, the WHOQoL Bref was then developed: it constitutes a short form for QoL assessment that looks at domain level profiles (Seattle Quality of Life Group, 2011).

The WHOQoL Bref: This measure is composed of 24 items plus other two separate items, aimed at asking, respectively, about an individual's overall perception of QoL and the perception of his/her own health (Health Satisfaction). Instead, the other items are distributed into four domains: Physical health (7 items), Psychological health (6 items), Environmental health (8 items) and Social relationships (3 items). Each item is rated on a 5-point Likert scale and is scored from 1 to 5 on a response scale. Domain scores are scaled in a positive direction, so that higher scores denote a higher QoL. Some items from the Physical health domain (Physical pain, Medical treatment) and from the Psychological domain (Blue feelings) require an inverse scoring. The mean score of items within each domain is used to calculate the domain score, that may be standardized to make it comparable with the other domains (WHOQoL Group, 1998; Skevington, Lotfy, O'Connell & the WHOQOL Group, 2004).

Table-1: Descriptive statistics of the variables

			M	SD	Min.	Max.
Age			63.55	10.97	26.00	95.00
Years at the LUTE			2.82	1.34	.08	5.00
Hours per week			6.74	5.08	1.00	35.00
	f	%			f	%
Age			*Role at the LUTE**			
26-64	160	47.06%	Learner		273	80.29%
65-95	180	52.94%	Volunteer		38	11.18%
Gender			Teaching at the LUTE		22	6.47%
Female	243	71.47%	Learner/Volunteer		14	4.12%
Male	97	28.53%	*Choice to Attend the LUTE*			
Marital Status			Individual Decision		185	54.41%
Single	33	9.71%	Friends' advice		104	30.59%
Married	218	64.12%	Relatives' advice		38	11.18%
Divorced	20	5.88%	No answer		13	3.82%
Widowed	54	15.88%	Satisfaction from LUTE Activities			
No answer	15	4.41%	Not at all		4	1.18%
Education			Poor		18	5.29%
Primary school	81	23.82%	Enough		176	51.76%
High school	194	57.06%	Good		55	16.18%
Academic	59	17.35%	High		64	18.82%
Living Arrangements			No answer		23	6.76%
Alone	38	11.18%	Successful Aspects**			
Spouse	85	25.00%	Possibility to socialize		230	67.65%
Family	217	63.82%	High number of courses		197	57.94%
Access to Internet			Type of activities		95	27.94%
Yes	277	81.47%	Volunteers' motivation		63	18.53%
No	63	18.53%				

Note-1: M = Mean, SD = Standard deviation, Min. = Minimum value, Max. = Maximum value
Note-2: * = Some people were both teachers and learners, ** = Multiple answers were possible

The information obtained through the administration of the WHOQoL Bref can be seen in Table-2. The highest mean values have been reported for "Physical pain", "Getting around", "Activity" and "Blue feelings". Overall, people in the sample enjoy good health; they can get around alone without any physical problem that could reduce their working skills or their energy. Environmental factors such as "Money" (2.81) and "Health services" (2.67) presented, instead, lower values comparing to the other items.

Procedures

The aim of the first part of the analysis was to outline the impact of demographic variables and the WHOQoL Bref items impact on QoL. First of all, a pair-wise correlation analysis among the WHOQoL Bref items and the domains within which they are grouped has been carried out; in this way, it has been possible to identify those items showing, at least, a moderate and significant correlation with the global QoL score (> .40) and among themselves: some of these items, namely "Health satisfaction", "Enjoy life", "Meaning", "Money", "Leisure", "Personal relationships", and the whole Physical health domain score have been included in the regression analysis analysis (see Table-3).

All the four WHOQoL Bref domains are significant and show a correlation coefficient high-

Table-2: Descriptive statistics of WHOQoL Bref

Variable	M	SD	Min.	Max.
QoL	3.68	.68	2.00	5.00
Health satisfaction	3.42	.97	1.00	5.00
Physical pain*	4.33	.68	2.00	5.00
Medical treatment*	3.75	.91	1.00	5.00
Energy	3.45	.76	1.00	5.00
Getting around	3.96	.97	1.00	5.00
Sleep	3.42	1.06	1.00	5.00
Activity	3.86	.74	1.00	5.00
Working skills	3.84	.68	1.00	5.00
Physical health domain	26.68	3.80	14.00	35.00
Enjoy life	2.70	.85	1.00	5.00
Meaning	3.33	.95	1.00	5.00
Concentration	3.16	.81	1.00	5.00
Body aspect	3.36	.80	1.00	5.00
Self-satisfaction	3.86	.79	1.00	5.00
Blue feelings*	3.90	.77	2.00	5.00
Psychological health domain	20.39	3.51	11.00	29.00
Daily life safety	3.21	.75	1.00	5.00
Environment safety	3.24	.78	1.00	5.00
Money	2.81	.68	1.00	5.00
Information	3.36	.83	1.00	5.00
Leisure	3.06	.85	1.00	5.00
Place	3.56	1.02	1.00	5.00
Health services	2.67	.92	1.00	5.00
Transports	3.72	.65	2.00	5.00
Environmental domain	25.62	4.23	11.00	37.00
Personal relationship	3.84	.88	1.00	5.00
Sexual life	3.36	.94	1.00	5.00
Friendship	3.62	.91	1.00	5.00
Social domain	10.83	2.04	4.00	15.00

Note 1: M = Mean, SD = Standard deviation, Min. = Minimum value, Max. = Maximum Value, QoL = Quality of Life
Note 2: * = The items "Physical pain", "Medical treatment" and "Blue feelings" have to be interpreted with a reverse scoring.

er than .40, with the highest value for Physical health domain (.60). The latter, employed as regressor, includes the items related to "Physical pain", "Medical treatment", "Energy", "Getting around", "Sleep", "Activity", "Working skills"; each of them shows, indeed, a significant correlation with the QoL score. Among the other items considered for the regression analysis, "Enjoy life" and "Meaning" have been considered for the Psychological domain; the items "Money" and "Leisure" represent the Environmental dimension, while "Personal relationships" is related to the Social dimension. Other control variables were age, gender, graduate education and living arrangements with family.

The econometric and correlation analyses

The econometric estimation has been run by means of an ordered logit model, which is applied when the outcome variable is categorical but not binary. In this case, the dependent variable is the score attributed to the QoL item in the WHOQoL Bref ("How would you rate your quality of life?"), that can get values from 1 (= poor) to 5 (= excellent).

In the ordered logit model, there is an observed ordinal variable, Y, that is a linear function of another latent variable, Y*, continuous and not measured. The latent variable Y* has different threshold points: the probability of observing a given outcome corresponds to the probability that the estimated linear function, plus random error, is

within the range of the cut-points estimated for the outcome.

The continuous latent variable is equal to:

$$Y^*_i = \sum_{k=1}^{K} \beta_k X_{ki} + \varepsilon_i$$

The βs are the coefficients to be estimated, x_{1i}, x_{2i}, …, are the regressors employed and ε_i is the error term, that is assumed to be logistically distributed. There is no intercept term. The coefficients βs are estimated together with the cut-points that, as it has been said, allow to calculating the probability that Y will take on a particular value.

Finally, the last part of the analysis looked specifically at the experience of the LUTE in Sicily and was aimed at identifying the factors that can be associated with a very high satisfaction from attending these activities.

A correlation analysis was performed, employing as explained variable a dummy assuming value = 1 if a high level of satisfaction for the LUTE activities was declared and = 0 otherwise. Other variablesb were the WHOQoL Bref dimensions already employed in the econometric analysis, the respondents' role within the institution (volunteer or learner), the number of hours spent weekly at the LUTE and the judgment about its likely successful aspects.

Results

Pearson's correlation coefficients were used to determine the relationship between the score attributed to QoL and the other dimensions of the WHOQoL Bref. All the WHOQoL Bref items are significantly correlated with the QoL score. The items with the highest correlations have been included as regressors in the econometric analysis (see Table-3). Other items presented lower, although significant correlations, such as "Health services" (.19), that concerns the easiness to access health services: probably other dimensions as "Money" (.46), or "Transports" (.49), that showed, instead, higher correlations, are thought to be more important in determining a higher QoL.

The low correlation with "Health services" indirectly signals how people joining the LUTE do not really need health assistance provided by public structures; rather, a high QoL is associated with the availability of money for sustaining current expenses and with accessible transports. Among the other items from the WHOQoL Bref, "Energy" shows the highest correlation (.57).

The variables included in the ordered logit estimation are listed in Table-4. The underlying hypothesis is that the QoL reported by people joining educational activities depends on physical, psychological, environmental and social factors, that are likely to be increased by the participation to educational programs.

The estimation results can be seen in Table-5. The usual interpretation of the ordered logit coefficient is that, for a one unit increase in the explanatory variable, the response variable is expected to change by its regression coefficient in the ordered log-odds scale, being constant the other variables in the model (Wooldridge, 2015).

Table-4: Variables employed in the ordered logit regression.

Variable	Characteristics of Variables
Age	Numerical variable
Gender	1 = male; 0 = female
Education: academic	1 = graduate; 0 = no graduate
Living with family	1 = lives with family; 0 = no
Access to internet	1 = can access internet; 0 = no
QoL score	Categorical variable; WHOQoL Bref item; values from 1 to 5
Health satisfaction score	Categorical variable; WHOQoL Bref item; values from 1 to 5
Physical health domain score	Sum of the physical health domain items score
Enjoy life score	Variable related to psychological health domain
Meaning score	Categorical variable; psychological health domain
Money score	Variable related to environmental domain
Leisure score	Variable related to environmental domain
Personal relationship score	Variable related to social domain

Table-3: Pairwise correlations among WHOQoL Bref items

	QoL	HS	PP	MT	En.	GA	Sleep	Act.	WS	PD	EL	Mean.	Conc.	BA	SS	BF	PD	DS	ES	Mny.	Inf.	Leis.	Place	HS	Trans.	ED	PR	SL	Frnd.
Health satisfaction (HS)	.46*																												
Physical pain (PP)	.39*	.35*																											
Medical treatment (MT)	.24*	.26*	.40*																										
Energy (En.)	.57*	.41*	.45*	.36*																									
Getting around (GA)	.38*	.25*	.36*	.27*	.43*																								
Sleep	.44*	.35*	.30*	.23*	.42*	.32*																							
Activity (Act.)	.41*	.30*	.43*	.35*	.47*	.30*	.27*																						
Working skills (WS)	.36*	.33*	.30*	.29*	.42*	.36*	.17*	.52*																					
Physical health domain (PD)	.59*	.48*	.66*	.62*	.75*	.67*	.63	.69*	.62*																				
Enjoy life (EL)	.59*	.30*	.30*	.13*	.54*	.36*	.35*	.29*	.26*	.47*																			
Meaning (Mean.)	.51*	.28*	.27*	.18*	.48*	.27*	.29*	.30*	.29*	.43*	.56*																		
Concentration (Conc.)	.39*	.24*	.23*	.18*	.41*	.34*	.23*	.31*	.32*	.43*	.43*	.44*																	
Body aspect (BA)	.39*	.34*	.21*	.21*	.48*	.24*	.25*	.43*	.38*	.47*	.35*	.42*	.36*																
Self-satisfaction (SS)	.39*	.33*	.23*	.26*	.45*	.23*	.23*	.44*	.49*	.49*	.32*	.48*	.37*	.53*															
Blue feelings (BF)	.25*	.26*	.27*	.13*	.27*	.17*	.34*	.30*	.30*	.38*	.30*	.34*	.33*	.27*	.39*														
Psychological health domain (PD)	.61*	.42*	.37*	.27*	.63*	.39*	.41*	.52*	.50*	.66*	.72*	.79*	.68*	.71*	.75*	.61*													
Daily life safety (DLS)	.43*	.26*	.22*	.18*	.51*	.31*	.26*	.28*	.35*	.43*	.43*	.36*	.39*	.32*	.32*	.27*	.50*												
Environment safety (ES)	.38*	.19*	.23*	.15*	.32*	.25*	.20*	.23*	.19*	.32*	.34*	.30*	.25*	.15*	.18*	.21*	.37*	.55*											
Money (Mny.)	.46*	.26*	.15*	.04	.34*	.27*	.23*	.21*	.29*	.31*	.35*	.32*	.35*	.37*	.31*	.27*	.45*	.38*	.33*										
Information (Inf.)	.38*	.26*	.26*	.17*	.45*	.30*	.19*	.35*	.31*	.41*	.32*	.37*	.29*	.29*	.27*	.21*	.41*	.42*	.38*	.42*									
Leisure (Leis.)	.45*	.16*	.22*	.09	.34*	.26*	.24*	.34*	.32*	.37*	.43*	.28*	.31*	.23*	.27*	.24	.45*	.40*	.32*	.32*	.40*								
Place	.23*	.21*	.02	-.01	.18*	.10	.18*	.13*	.15*	.15*	.31*	.24*	.07	.13*	.21*	.21*	.21*	.28*	.18*	.20*	.20*	.15*							
Health services (HS)	.19*	.27*	.24*	.09	.18*	.03	.10	.21*	.12*	.18*	.22*	.19*	.08	.19*	.11*	.11	.22*	.20*	.19*	.28*	.27*	.24*	.26*						
Transports (Trans.)	.49*	.32*	.26*	.17*	.49*	.31*	.28*	.37*	.40*	.46*	.49*	.41*	.36*	.32*	.39*	.31*	.55*	.61*	.57*	.54*	.64*	.61*	.45*	.46*					
Environmental domain (ED)	.55*	.36*	.30*	.16*	.51*	.33*	.31*	.40*	.39*	.49*	.54*	.45*	.37*	.37*	.38*	.34*	.60*	.60*	.67*	.62*	.70*	.64*	.54*	.56*	.91*				
Personal relationship (PR)	.42*	.27*	.12*	.03	.30*	.20*	.16*	.37*	.36*	.32*	.36*	.40*	.16*	.38*	.40*	.26*	.46*	.46*	.27*	.25*	.35*	.35*	.28*	.15*	.39*	.42*			
Sexual life (SL)	.25*	.13*	.02	.14*	.22*	.12*	.19*	.13*	.27*	.23*	.27*	.20*	.25*	.20*	.35*	.19*	.33*	.33*	.16*	.24*	.10	.19*	.10	.02	.25*	.22*	.39		
Friendship (Frnd.)	.21*	.09	.06	.023	.23*	.16*	.16*	.23*	.13*	.20*	.33*	.30*	.11	.21*	.21*	.12*	.30*	.30*	.27*	.13*	.38*	.25*	.33*	.14*	.35*	.39*	.49	.24*	
Social domain (SD)	.40*	.23*	.12*	.13*	.36*	.24*	.25*	.30*	.37*	.37*	.44*	.41*	.26*	.35*	.47*	.31*	.51*	.51*	.32*	.33*	.38*	.38*	.30*	.13*	.48*	.48*	.80*	.73*	.75*

Note-1: * = p ≤ .05

Here, the dependent variable is the QoL score. All the estimated coefficients are significant but for the variable "gender", that assumes value = 1 if the respondent is male and = 0 otherwise. The sign for "gender" is positive: this means that, although they are not the majority of the people in the sample, men declare a higher QoL comparing to women. Age shows a positive correlation, indicating how the probability to report a higher value for QoL increases with aging.

The coefficients for the WHOQoL Bref scores are significant as well, and the highest has been estimated for the item related to "Enjoy life". The variable "living with family" is inversely and significantly correlated with the dependent variable.

Table-5: Ordered logit regression results

Variable	Coefficient	Standard Error
Age	.03**	.01
Gender	.04	.30
Education: Academic	.76**	.37
Living with family	-.89***	.32
Access to internet	1.31***	.38
Health satisfaction score	.48***	.18
Physical health domain score	.27***	.06
Enjoy life score	1.36***	.26
Meaning score	.44**	.20
Money score	.67***	.25
Leisure score	.36**	.19
Personal relationships score	.31*	.18
Cut 1	15.02	2.18
Cut 2	19.34	2.41
Cut 3	26.09	2.86

Note-1: Wald $Chi^2(13) = 114.63$, Prob > $Chi^2 = 0.0000$; Log Pseudo Likelihood = -161.49076, Pseudo $R^2 = 0.4530$

Note-2: * = p ≤ .10, ** = p ≤ .05, *** = p ≤ .01

"Access to internet" is positively correlated, as expected. In fact, internet makes it easier to communicate and to retrieve information, and allows keeping pace with times: many people who answered the questionnaire were attending ICT courses and became familiar with these technologies because of such courses.

Having obtained the degree is positively and significantly correlated with the dependent variable and signals the value of education as a factor that can improve QoL and that it is likely to make educational activities appreciable. However, the greatest impact in determining a higher QoL is attributable to the capacity of enjoying life, which is even higher than the score obtained for the whole Physical health domain.

Since the survey was aimed at outlining the most successful aspects of the LUTE organization and the factors that may impact on a high level of satisfaction, the second part of the analysis has considered specifically the circumstance to declare a very high satisfaction due to the attendance to the courses and other activities.

The correlations among the level of satisfaction and the variables related to the personal experiences at the LUTE, as the roles played within the organization (learner or volunteer, and the hours spent in both roles over the total hours spent at the LUTE), the years since the enrollment, the weekly hours dedicated to the activities and the likely reasons for the success of the initiative have been calculated. The results can be seen in Table-6.

The most of the respondents (almost 52%) are enough satisfied with the courses and the activities followed; less than 10% of the participants to the survey are not satisfied, whereas 6.74% are uncertain or prefer not to answer. A very high level of satisfaction has been declared by the 18.82% of the respondents, who judge irrelevant eventual faults in the organization and management of courses; indeed they ask for more activities.

The correlations with the WHOQoL Bref items are positive and significant: The highest correlations have been found for "Physical health domain" (.31) and, among the single items, "Leisure" (.26) and "Personal relationship" (.27).

In spite of the relevance of the item "Personal relationship", the possibility to socialize, that was indicated among the most likely reasons for the good performance of the LUTE, has not found significant. Instead, more years spent at the LUTE are associated with higher levels of satisfaction. The role of volunteer is significantly correlated with a high level of satisfaction, and the coefficient (.19) is higher comparing to the coefficient associated

Table-6: Pairwise correlations among variables related to experience at the LUTE

	HgS	Age	Gndr.	GE	LF	AI	LUTE	Hrs.	QoL	HS	PD	EL	Mean	Mny.	Leis.	PR	Vol.	Learn	Hrs.V	Hrs.L	NC	OS	VA
Age	-.09																						
Gender (Gndr.)	-.04	.18*																					
Graduate education (GE)	.10	-.09	-.05																				
Living with family (LF)	-.03	-.18*	-.02	.05																			
Access to internet (AI)	.13*	-.17*	.03	.08	.00																		
Years at LUTE (LUTE)	.23*	.23*	-.06	.17*	-.03	.08																	
Hours per week (Hrs.)	.16*	.15*	-.07	-.07	-.16*	.05	.27*																
QoL	.20*	-.03	.01	.16*	-.14*	.22*	.05	.13*															
Health satisfaction (HS)	.18*	.05	-.01	.08	-.07	.07	-.01	.12*	.46*														
Physical health domain (PD)	.31*	-.25*	-.01	.06	-.10	.15*	.00	.04	.59*	.48*													
Enjoy life (EL)	.15*	-.15*	.06	.10	.09	.13*	-.01	-.00	.59*	.30*	.47*												
Meaning (Mean)	.14*	-.12*	-.04	.06	-.00	.18*	-.011	.04	.51*	.28*	.43*	.56*											
Money (Mny.)	.21*	.18*	-.02	.19*	-.04	.11*	.14*	.01	.46*	.26*	.31*	.35*	.32*										
Leisure (Leis.)	.26*	-.04	.03	.08	-.05	.18*	.15*	.10	.45*	.16*	.37*	.43*	.28*	.32*									
Personal relationship (PR)	.27*	.06	.05	.01	-.03	.12*	.09	.19*	.42*	.27*	.32*	.36*	.40*	.25*	.35*								
Volunteer (Vol.)	.19*	-.03	.11*	-.04	-.18*	.05	.29*	.40*	.13*	.08	.08	.08	.00	.10	.17*	.22*							
Learner (Learn)	.01	-.02	-.01	.07	.07	.20*	-.17*	..17*	-.02	.03	.08	-.09	-.02	.03	.00	-.03	-.39*						
Hours as volunteer/total (Hrs.V)	.20*	.01	.13*	.00	-.13*	.06	.32*	.64*	.16*	.07	.06	.12*	.10	.12*	.20*	.23*	.81*	-.38*					
Hours as learner/total (Hrs.L)	.04	.16*	.01	-.08	-.12*	.13*	.07	.58*	.09	.12*	.09	-.07	-.01	.03	.06	.09	-.07	.51*	.01				
Number of course (NC)	.20*	-.07	-.00	.15*	.09	.20*	.07	.15*	.08	.01	.12*	.14*	.17*	.13*	.18*	.17*	.09	.18*	.14*	.10			
Opportunity to socialize (OS)	-.04	.10	-.06	-.01	-.02	.04	-.06	.04	.03	.05	-.08	.06	.07	.09	-.02	.12*	.10	.02	.09	-.03	-.12*		
Variety of activities (VA)	.20*	.06	-.02	.23*	.02	.09	.20*	.15*	.19*	.04	.12*	.12*	.09	.13*	.28*	.22*	.13*	.08	.13*	.10	.13	.11*	
Volunteers' motivation	.18*	.01	.08	.14*	.075	.07	.08	.20*	.10	.04	.04	.14*	.18*	.18*	.18*	.21*	.27*	-.03	.31*	.05	.25*	.17*	.26*

Note-1: HgS = High satisfaction

Note-2: * = $p \leq .05$

to the role of learner (.11, that, indeed, is not significant). Moreover, the larger the fraction of hours spent as volunteer rather than as learner only, the higher the satisfaction.

Hence, a higher QoL is associated to an active role within the institution; this conclusion is in line with the objectives of social inclusion and participation that are at the basis of the UTAs. In this light it can be interpreted the positive and significant correlation between the hours spent every week at the LUTE and a high level of satisfaction: spending time in such activities has overall, a positive effect on QoL.

Discussion

Although preliminary, the analysis has shown interesting insights, which may be examined more in depth in further analyses. It was observed a positive effect on QoL, coming from attending educational and recreational activities, given the observed sample's characteristics and people's personal interests.

Almost all the regressors employed in the econometric analysis presented a good level of significance. Variables as age, graduate education and the possibility to access internet, employed as controls, were positively and significantly correlated with higher QoL levels.

The literature on the topic supports the hypothesis that, on average, the frequency of informal social activities decreases with advancing age, which is probably a consequence of age-related decline of functional status (Huxhold, Fiori, & Windsor, 2013). Other contributions have shown how age, gender, education and other variables attaining family composition are closely related to older adults' QoL (Pinquart, 2001) and are predictors of leisure activity and satisfaction patterns.

The results for the case study examined confirm other main findings from the literature. For example, in the regression analysis, living with the family has been found to have a negative impact on QoL. There are many issues to consider to assess whether a multigenerational living is a positive experience for all or not. Living together offers the opportunity to learn from each other and to share daily experiences. Especially the elderly may enjoy living with their own family: they could have the opportunity to be useful to other family members and, at the same time, to be well cared (Gerstein, 2007). However, these advantages may be associated with some disadvantages, such as a lower autonomy and independence: the older adults may feel unhappy about the transition from self care to dependency and may be concerned about being a burden and conditioning the family's lifestyle. Moreover, there might be a higher workload, especially for women living with their families. In fact, many older women care for grandchildren and play an essential role within the family, that sometimes involves a greater risk of psychological and physical pressure (Hughes, Waite, LaPierre & Luo, 2007).

In the regression analysis, the "Personal relationship" score was positively and significantly correlated with QoL; a positive and significant relationship with a high level of satisfaction for the social activities was also observed in the second part of the analysis. However, since "Personal relationship" includes both family and friend relationships, an open issue is clarifying the extent to which family ties and friendship relations impact on QoL. Some scholars (Krause & Rook, 2003) believe that family relations are more difficult to cease than voluntary friendship relations; therefore, it is plausible to predict that informal social activities performed with friends, but not with family, may be more frequently associated with individual wellbeing (Dupertuis, Aldwin, & Bosse, 2001; Rook & Ituarte, 1999). Other studies outlined how the social support provided by friends, wellbeing and positive feelings increase with increasing age (Li, Fok, & Fung, 2011).

About the type of support provided by family and friends, the instrumental support is more prominent in family relations, whereas social integration and reaffirmation of self-worth are more characteristic of friendship relations (Messeri, Silverstein, & Litwak, 1993). Hence, although both family and

friends may provide instrumental and affective support, friends are more likely to increase the positive mood and to lower negative affective feelings, augmenting life satisfaction (Merz & Huxhold, 2010; Huxhold, Miche & Schüz, 2013). This conclusion reinforces the importance of establishing sound relationships and of sharing common objectives, being them social or educational.

To sum up, all the WHOQoL Bref items included in the analysis showed the expected signs and were significant. The highest coefficient for "Enjoy life" confirms how this is the factor that more consistently impacts on QoL. The concept of enjoying life means the extent to which a person experiences positive feelings of contentment, balance, happiness, hopefulness, joy and appreciates the good things in life. Certainly, social and educational activities may strengthen this aspect.

Conclusions

The present study can be framed within the literature aimed at investigating the effects of adult education and the participation at social and/or leisure activities on individual QoL. The study was aimed at discussing some critical issues in defining and analyzing the implementation of an active aging model at the UTA located in a Southern Italian town.

The learners' experiences have clearly shown that education had a very positive influence on their lives. In the case study examined, the enrollment in social and educational programs like the LUTE, involves more than simply attending classes; overall, the institution allows people to preserve their own physical and psychological traits from aging, to share experiences with other people and to see the world from another perspective.

The econometric analysis, based on the estimation of an ordered logit model, has outlined the impact on QoL of some factors, among which there are some WHOQoL Bref items as "Enjoy life" and "Meaning". These items are significantly correlated with a high level of satisfaction for the activities followed.

Overall, the LUTE reached the objectives of favoring socialization and improving the reported QoL for people who are involved in its various activities. Its positive performance can also be appreciated from an economic point of view, considering that this institution can count on the contribution offered by the participants. They are often professionals still in the workforce, or retired academics, who find in their work a reason to remain active. Hence, the positive outcome consisting in the improvement of QoL can be obtained at null or very low costs.

From a public perspective, positive consequences might be possibly represented by a reduction in expenses for health assistance due to a positive impact on the older adults' physical and mental health, which is also the objective of healthy ageing policies. According to the main features of healthy aging, above mentioned, that consist in a low probability of disease and disease-related disability, a high cognitive and physical functional capacity and an active engagement with life, all these aspects were observed in the case examined: the majority of people in the sample were autonomous, satisfied with their lives and the activities performed, and declared they did not need any personal or home assistance.

The analysis might be replicated in other contexts, for example in other Italian areas or other European countries, where similar institutions have been developed. The main weakness of the analysis lies in the fact that it considers just the people joining this institution and attending its initiatives. The comparison with a control group of people with similar demographic characteristics, who are not involved in any activity, might allow to quantify the impact on individual QoL and, overall, on the social wellbeing, and would allow to estimate the incremental benefit of developing educational programs.

Another crucial aspect to analyze more in depth is the role played by individuals within the institution. Sometimes the participants' involvement goes beyond the walls of the classrooms (Escuder-Mollon, 2012). The learners' active participation may be

achieved by letting them to be responsible of organizational tasks, for example taking part at the decision-making board or collaborating in organizing extra-academic activities, or disseminating their work through web tools (websites and blogs).

It has been seen how a higher satisfaction is associated with the hours spent as volunteer, although the attendance to classes requires a longer time. Investigating this aspect might allow a more accurate analysis on individuals' preferences towards alternative ways to allocate their free time.The positive effects of the participation to educational and leisure activities have to be taken into account by policy makers, who should be aware to what extent they are beneficial to the older population.

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Developing Multiple Evaluation Frameworks in an Older Adults Care Information System Project: A Case Study from Taiwan

Chia Lun Lo[1] & Zhi Yuan Su[2]

Abstract

Many hospital managers agree that they can copy their successful experience in the medical center through implementing the information system (IS) successfully in the older adults care institution. However, these facilities are not the same care model as general hospitals. In addition, the scales of operation in older adults care institution are often rather small and they cannot undertake IS project with a high failure risk. Thus, the same standards for evaluating a successful implementation cannot be guaranteed for both types of institutions. A suitable system evaluation framework before the whole system migrates is very important, especially in the older adults care institution with low informatization levels. The goal of this study is emphasized by developing an innovative system project and its' multiple evaluation framework in our case which turned to be a research-action, study participant comprising whole staffs and its residents of the older adults care village of biggest health care group in Taiwan. The results describe our resulting functional design of the system, multiple evaluation framework phases, and several challenges, difficulties or attentions. The contribution of this study is our project design and practical feasibility and execution of its evaluation methodology to an older adults care institution.

Keywords: Older adults care information system, system evaluation framework, Information system implementation

Key Practitioners Message

- Introducing an information system for older adults care institution in a holistic care concept helps practitioners to improve the work effectiveness of health care teams.
- Perceptions regarding the comprehensible and practical evaluation method of the information system for the older adults' institution might be the important topics for health care professionals.
- Both personal satisfaction and organization benefit of the caregivers and residents might be affects the successful implementation

Introduction and Background

The aging of society has become an important issue, leading not only to pressure in small families from a shortage of care workers, but also to increase in expenses for elderly welfare and medical care. Thus, older adults care is being gradually replaced with community care. The increasing demand for this type of older adults care institution within such a short period of time illustrates the shortage of care workers in institutions, which may cause a lower efficiency in services and a decrease in medical quality. To improve the quality of older adults care in aging country and resolve the issue of labor shortages in older adults care institutions, the government proposed a program for constructing an integrated information system for caring older adults by information technology,

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with all system functions designed on the concept of "holistic care." Based on this concept, the five keys points for older adults support are independence, involvement, self-realization, care, and dignity. Ideally, this concept should concentrate on giving personalized care for recipients under the fundamental framework of nursing care after caretaker interaction (Hurlock-Chorostecki, 1999).

In the field of health information, most medical institutions believe that information systems can help reduce clinical mistakes, increase care efficiency, and support health-care decisions (Bates et al., 2001; Moehr, 2002). However, a number of medical institutions believe that implementing an information system may lead to significant failure risks (e.g., spend high costs and long implementation times but IT project with high failure rates). In both research and practice in the field of medical healthcare, it is believed that conducting evaluations before implementing an information system is very important. Although evidence has shown that implementing a modern information system can indeed help an enterprise make significant and efficient improvements, for the successful adoption of integrated information systems, it is still necessary to understand the efficient usage of an information system.

Most previous evaluation reports have focused on the differences in data between expected and actual results post system implementation, and determine how successful a system has been in achieving its expected goals. However, a number of systems have failed for many other reasons, particularly user resistance. Several studies have indicated that it is inappropriate to not include user acceptance in system-evaluation methods (Kaplan, 2001). In addition, some studies have suggested that systems can be optimized based on user feedback (Sinchenko, Westbrook, Tipper, Mathie, & Coiera, 2003). The measurement methods used to evaluate whether an information system has been successfully implemented have been changing, from methods regarding technical issues to those regarding manpower and organizations issues, and from objective methods to subjective methods (Ammenwerth & de Keizer, 2005). During the past 15 years, the most popular issue in the field of information management has been to determine whether an information system has been successfully implemented based on user feedback. Several evaluation methods based on theory and subjective user perceptions have been introduced (Aggelidis & Chatzoglou, 2009; Elske Ammenwerth, Iller, & Mahler, 2006; Brender, Ammenwerth, Nykanen, & Talmon, 2006; Chang, Chang, Wu, & Huang, 2014; Jen & Chao, 2008; Lee, Mills, Bausell, & Lu, 2008; Tsiknakis & Kouroubali, 2009; Tung, Chang, & Chou, 2008; Yu, Li, & Gagnon, 2009). Although these social-science based evaluation models have been widely applied in the healthcare field, according to some studies, the evaluation methods used for hospital information systems (HIS) are still confusing and lack in specificity (Gremy, Fessler, & Bonnin, 1999; Yusof, Papazafeiropoulou, Paul, & Stergioulas, 2008).

Besides, previous studies have been stated that social negotiations (such as the pre-sale development phase or finding support from stakeholders) are key factors to the successful implementation of an information system in hospital (Berg, 2001; Greenhalgh, Potts, Wong, Bark, & Swinglehurst, 2009; Sittig & Singh, 2010). The reason for this requirement is also happened in the institution of older adults care, most users are not involved in the discussions before a new system is implemented, and are compelled to use the new system after its implementation. User environments for those forced to use a system, and for users who have been involved in the system development, are quite different (Garcia-Smith & Effken, 2013). In addition, a lack of sufficient consideration regarding clinical situations and whether a patient's health conditions can be improved may lead to ideas deviating from the original expectations of this field.

Facilities for older adult chronic care are not the same as general hospitals for acute care. The same standards for evaluating a successful implementation cannot be guaranteed for both types of institutions. The physiological conditions of the older adults are better than the patients in the acute hospital. Thus, the focus of older adults facilities is usually on keeping the vital signs of the patients' stable and providing overall comprehensive care.

Furthermore, the scale of operation in older adults care facilities are often rather small; therefore, investment efficiency is a very important issue. Evaluation methods should also consider the cost of investing in an information system.

Purpose of the Study

In this study, we proposed a proper and practical evaluation framework to evaluate the implemented one information systems for the older adults care facilities in a real case. We assumed all the older adult person in our case can act by themselves, therefore, we can collected the residents' perceptions, the health conditions of them, and the cost improvements as evaluation factors of the framework. Furthermore, in our opinion, a good information system for the older adults care institution can stick to the core value of care, it should be used to help caretakers complete their nursing tasks and satisfy the older adults living in such facilities, no matter in mentally or physiologically. The purposes of this study include the following:

(1) To develop an information system for older adults care institution in a holistic care concept, called the ubiquitous healthcare system (UCARE system);

(2) To propose a comprehensible and practical evaluation method for information systems for the elderly; thus, our study can be considered as a means to enhance current research frames and practical methods;

(3) To evaluate the cost benefit for and organization, caretaker's satisfaction, and illustrate how the health conditions of an institution's residents are improved by the system.

Methods

The U-CARE system project spend one and half year and it was developed based on the concept of OOAD (Object-Oriented Analysis and Design technical approach), using UML (Unified Modeling Language) as the syntax for requests. All sub-systems are interconnected. To reduce the complexity of relationships among the sub-systems, we adopted SOA (Service-Oriented architecture) as our system architecture. For the purpose of ubiquitous care, we constructed our system in a Web-based environment. Microsoft .Net 3.0 on an IIS7.0 environment is used as the system development platform. ASPX and C# are used as the programming languages. The programming team tested each unit after its programming phase was completed, and created the related testing records. During the unit tests, each module of the system was tested separately to capture any errors within the module and confirm its internal consistency and logical correctness.

The long-term U-CARE information system described in this study was designed from the perspective of integration. Data from various working processes were integrated across the different sub-systems. Therefore, guaranteeing the quality of the system is very important. Otherwise, missing data may lead to errors in the functions of other sub-systems.

The most common measurement methods adopted in most studies regarding the prediction of whether an information system will be successfully implemented are based on user satisfaction post-implementation. However, the health-care industry is a type of service industry. In older adults care institution, in particular, most residents can take care of themselves and have the right to choose whether they want to move into the facility. Therefore, there is a lack of a sufficient empirical base for cases solely determined by subjective caretaker satisfaction. For this study, we conducted a satisfaction survey regarding our system and interviews to retrieve information on subjective perceptions, provided several complete training courses for the system to control the quality of our survey data, and adopted a quasi-experiment method to measure the differences related to the medical staff and the residents between the pre- and post-implementations of the system. These differences include the health conditions of the residents, the time costs spent on the job to the staffs, and the improvements in efficiency. Figure-1 shows the system evaluation framework designed for this study. Therefore, there are hypotheses developed according to the research model.

H1: Personal satisfaction the caregivers on using UCARE system positively affects the successful implementation

H1: Personal satisfaction of the residents on using UCARE system positively affects the successful implementation

H2: Organization benefit of the caregivers on using UCARE system positively affects the successful implementation

H2: Organization benefit of the residents on using UCARE system positively affects the successful implementation

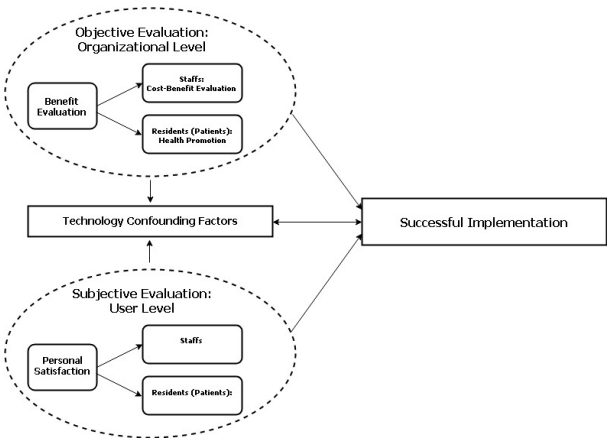

Figure-1: Evaluation framework

Participants

For this study, we interviewed both the nursing staff and residents of the largest older adults care institution in Taiwan, the Chang Gun Health and Culture Village, owned by Chang Gung Group. Two groups of participants took part in this survey. The first group is made up of staff members working at the institution. To objectively determine the degree of improvement after the system was implemented, data of the actual time spent on paperwork by the staff members before the system was implemented were collected. After the system was implemented, these data were compared with the data on the time spent using the proposed system for the same tasks. Through these comparisons, we discussed whether the implementation of the system can improve the working efficiency and save time spent on paperwork, allowing residents to be better cared for and the overall quality of care to be improved. A total of 20 questionnaires were obtained from the survey with the staff members of the institution. All of the participating caretakers were female, aged 25 to 40 (μ = 31.5), and with a college/university degree or higher. The second group surveyed was made up of residents in the institution. The characteristics of the both groups are shown in Table-1.

Table-1: Characteristics of the resident and caregiver participants (n = 273)

Residents		Demographics		Caregivers	
n	%		%	n	
117	42.90%	Gender	Male	10.00%	2
156	57.10%		Female	90.00%	18
-	-	Age	20-29	55.00%	11
-	-		30-39	40.00%	8
-	-		40-49	5.00%	1
-	-		50 above	-	-
78	28.57%		75 or below	-	-
66	24.18%		75-79	-	-
83	30.40%		80-84	-	-
46	16.85%		85 above	-	-
6	2.20%	Education	Illiterate	-	-
41	15.02%		Elementary school	-	-
30	10.99%		Junior high school	-	-
61	22.34%		Senior high school	-	-
135	49.45%		College / University	100.00%	20

Data Collection

Before developing and implementing the proposed system, we already knew that the medical staff members working in nursing facilities have quite limited computer competence, a lack of computer experience, and little knowledge on closely integrated computer concepts (Hsu, Hou, Chang, & Yen, 2009). Very few caretakers have used a medical care system before, let alone older adults. Therefore, before the system implementation, we spend two mouths to give them a computer competence educational training course and assigned member of study group to help them identify their true needs, and learn how to integrate information and which solutions are the

best. This kind of competence is a key to successfully developing such a system. Thus, to make sure that our system could be smoothly developed, for every sub-system there was a responsible system analyst familiar with the field of medical care in this project. These system analysts designed and provided certain training courses after the system was completed. The contents of these courses covered all system functions and information needed to be collected for an evaluation. The paper-based data of the activities of some of the residents and users during the pre-test were also collected; allowing the data collection and comparison procedures to be performed and smoothly completed after the system was implemented.

Subjective Measurement

This system was designed to evaluate through various methods whether the U-CARE system can actually meet user demands. The first method adopted was an information quality evaluation method used by our predecessors to evaluate whether an information system has been successfully implemented. According to DeLone and Mclean (2003), information quality refers to the quality of outputs the information system procedures, which can be in the form of reports or online screens. They also mentioned the most measures of information quality are from the perspective of the user the information system and are subjective measures. It refers to measure of information and data for desired characteristics as the quality of output from a system included accuracy, precision currency, reliability completeness, conciseness, accessibility, adaptability, relevance, understandability, meaningfulness, timeliness, comparability and format. For information to be effective in the care institution, it also possess the characteristics and must be easy to understand and consistent outputs.

In this study, the method of this part is mainly based on user satisfaction after the system has been implemented and is quite a mature method. And the theoretical structure of the evaluation theory is shown in Figure-2.

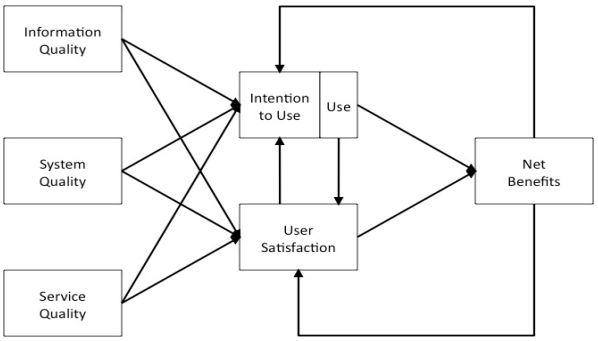

Figure-2: Updated Information System Success Model (Delone & McLean, 2003)

Long Term Information System Satisfaction Questionnaire (LTIS): For the present study, we developed a survey tool called the Long Term Information System Satisfaction Questionnaire (LTIS) to measure subjective satisfaction from the angle of residents and caretakers based on the Information System Success Model and the characteristics of long-term care institutions. The residents construct covered service quality, system quality, information quality, user acceptance of the interface, and satisfaction with the sub-systems. The caretakers construct covered the influences on the organization and individuals. To make sure the participants could answer the questions correctly, the interviewers conducting this study first explained to how to fill out the questionnaire step-by-step before starting. Every item was designed as 3-5 structural questions. There were no negatively worded questions. The key points for the evaluation of the questionnaire are summarized in Table-2. The items in the measurement tool were five-point scale where 1 = strongly disagree and 5 = strongly agree. Cronbach's Alpha of each construct of the satisfaction scale used in this study was over 0.7, indicating the good reliability and validity of this measurement tool.

Objective Measurement

When conducting the system evaluation, one of the most important items among the objective data was the time consumption. First, to reduce any errors caused by the number of measurements taken and the number of people measured, after the paper-based operations to be compared were selected, the researchers measured the actual operation

Table-2: The major components of items

	The major components of items
System quality	To ask about the consistency, logic, reaction time of each sub-system
Data quality	To ask about the reliability, correctness, completeness of each sub-system
Service quality	To use the main sub-functions of each sub-system as the question items to collect opinions, and understand whether the data integration can adequately meet with the actual demands
User interface	The acceptance of residents and users of the operation, graphics, and multi-media
Organizational Impact	To use the influences of various organizational performance to express the agreement on whether the system can contribute to the work performance

time of all staff members and used the averages as the time required for the paper-based operations. In addition, to avoid differences in the actual efficiency caused by the learning curve of the operations during the online phase within a short period of time, this study also provided sufficient system operation training courses, and the actual time required for the operations was measured one week after actual use to make sure the study sufficiently strict and rigorous.

Data analysis

The questionnaire used in this study was designed based on studies related to the successful implementation of other information systems (Delone & McLean, 2002). The translation was checked by two professors with a degree in management information systems field to make sure it was accurate. The participants of the pilot-test were also the nursing staff and residents of the institution. The demographic data collected included the participants' gender, occupation, experience with computers, and age. The compared differences in the seven selected operations and degrees of improvements in the residents' health and effective of staff between the pre- and post-implementations of the system were also presented.

Results

The U-CARE system was designed based on the concept of "holistic care," which has been promoted in the medical field, stressing the provision of patient-centered medical care for the sick as well as providing correct and effective prevention methods, allowing care recipients to become healthy and satisfied physically, mentally, and spiritually. Thus, this study first defined the five main target needs in healthcare for the older adults based on the above-mentioned ideal:

1. *Physiological Needs:* Related items include medication requirements, chronic disease control, non-planned reception of medical treatment, health scale, and daily physiological measurements.
2. *Mental Needs:* Related items include a resident's interpersonal interactions and mental scale.
3. *Dietetic Needs:* Related items include nutrition evaluation scale, medication condition, and proper amount of nutrients.
4. *Home Needs:* Related items include the reception of guidance in terms of general health knowledge and the viewing of health education films.
5. *Sport Needs:* Related items include the amount of exercise, and the number of exercises conducted and their frequency.

For this study, we designed the U-CARE sub-systems according to the constructs of the planning described above. In the field of information systems, the famous IPO model proposed by McGrath (1984) has often been used to study issues related to group system interactions. The same viewpoint can also be used to modify the structure

Table-3: Subsystems design of U-CARE system by IPO model

Needs	Input	Process	Output
Physiological needs	Physiological data collection sub-system	Health education sub-system	Multimedia center sub-system, abnormal event notification sub-system, abnormal event tracking sub-system, health condition analysis sub-system
Mental needs	Health evaluation input sub-system	Activity arrangement sub-system	
Dietetic needs	Diet recommendation sub-system	Life reminder and information query sub-system	
Home needs	–		
Exercise needs	Indoor activity recording sub-system		

of a long-term care information system. This study adopted the five healthcare needs as their base, and three additional aspects, i.e., input, process, and output, as the thinking logics, for the design of 11 sub-systems (see Table-3).

The input sub-systems can be divided into a physiological data collection subsystem (IPPHS), health assessment entry subsystem (IPHAS), diet recommendation subsystem (IPDRS), and recording subsystem of indoor activities (IPIAS). The IPPHS can complete the physiological measurements through the use of many sensors and computers, and send the data to the system database. The IPHAS combines nursing care information with health assessment information: IPDRS using POS (point of sale) machines, which combine nutritional information with data on the ancillary restaurants of the institution to allow the ordering results of the older adults to be stored in the system, records the correlations between the nutrients they have consumed and their original diseases, actively reminding the older adults of their dietary recommendations or fasting menus. Finally, IPIAS can automatically record the limb movements of the residents through sensors installed inside the classrooms and activity areas, and store such information in the database to help the health care workers understand the amount of exercise the older adults are receiving.

In addition, the process subsystems can be divided into a health education subsystem (PCHES), activity arrangement subsystem (PCAAS), and information notification subsystem (PCNOS). The PCHES enabled older adult residents to see their own personal database on their medicine intake, daily dining information, and health education learning systems. The PCAAS could recommend suitable instituted group activities based on their interests and goodness-of-fit to improve their social skills and mental health. The PCNOS was used to remind them of dietary announcements, family visiting hours, and the exercise schedule.

In the process part of the sub-systems of UCARE, include the health education sub-system, activity arrangement sub-system, and information notification sub-system. With the health education sub-system, the older adult residents could check their own medication records in the database in their own rooms, information regarding their daily meals, and other health-education related information. With the activity arrangement sub-system, the social skills and mental health of the older adult residents could be improved based on their hobbies and adequacy. In addition, the life reminder and information query sub-system offered daily life reminders, family visitation reminders, and exercise reminders.

Finally, output mainly includes the multimedia center subsystem in the resident's rooms (OPMDA), which provided many types of information to the older adult residents. In addition, there was a notice subsystem (OPNOS) and a tracking subsystem for abnormal situations (OPTRS), as well as a health status analysis subsystem (OPANS).

The OPTRS reporting system let the nursing staff know about any abnormal situations by tracking abnormalities that can reduce the unplanned older adults medical treatment happened suddenly. OPANS provided multiple radar charts to analyze the health status of the older adults residents when their families came to visit, and is an approach for showing their health status in a timely fashion. Last, the most important sub-system for output is the multimedia center sub-system, which was available in the older adult residents' rooms and provided many types of information to them. In addition, there was also an abnormal event reminder and tracking sub-system, and a health-information analysis sub-system. The abnormal event reminder and tracking sub-system allowed caretakers to determine any abnormalities of the older adult residents and track them to reduce the number of such unplanned situations. The health information analysis sub-system offered various radar charts to present the analysis results of the health conditions of the older adult residents when their families visited. This function allowed the institution to show the health conditions of the older adults residents in real-time.

In terms of use, the proposed system contains 11 subsystems, but because they were designed based on the overall care of the residents, some of these subsystems were processed in the background, and the necessary information was sent as intermediary files among the different subsystems. Using the concept of a life gateway distributed in each resident's room as an information center, the storage of personal health information, as well as a bridge of communication among the older adult residents and their primary doctors and friends, was the responsibility of the gateway.

The system used the residents' IDs to connect all information stored in the database. This system tied in the care procedures, and used a nursing assessment taken when the residents were first hospitalized as the starting point; after moving into the hospital, the older adult residents could use digital physiological measurement devices to measure their vital signs. These devices retrieved their physiological information, such as their heartbeat, blood pressure, and blood sugar level, and through wireless networks, they could transmit the data on their measured vital signs to the life gateway to build complete personal records of their physiological parameters. In addition, the system could collect various types of assessment data from all kinds of mobile devices, POS, and input by the health care crew from their workstations in the institutions, and store the data in the U-CARE database. The health care crew could also store videos of activities and health education in the database in advance allowing the system to deliver the information to the residents. The residents could use their personal multimedia center to see their personalized data extracted from the database, including their health information, health education multimedia, dietary records, list of the institution's activities, their records of participation, and personal life suggestions.

Of course, through the proposed system, caretakers could check each resident's overall trend in their health condition, and get involved when their personalized health records showed an abnormality after receiving an active notification from the system. Lastly, families of the older adult residents could log into the system through the Internet and check the summarized care information of their loved ones, which was presented using radar charts, allowing the families to see their overall health conditions in terms of their physiological and mental condition, diet, home life, and exercise level. This means that the proposed system integrates data from various aspects based on the concept of holistic care. In this way, the families of the older adult residents did not need to worry about being able to access the health status of the loved ones. Figure-3 shows the integration of the proposed U-CARE system.

Discussion

The U-CARE system discussed in this study is a typical long-term institutional care information system. The two main types of users of this sys-

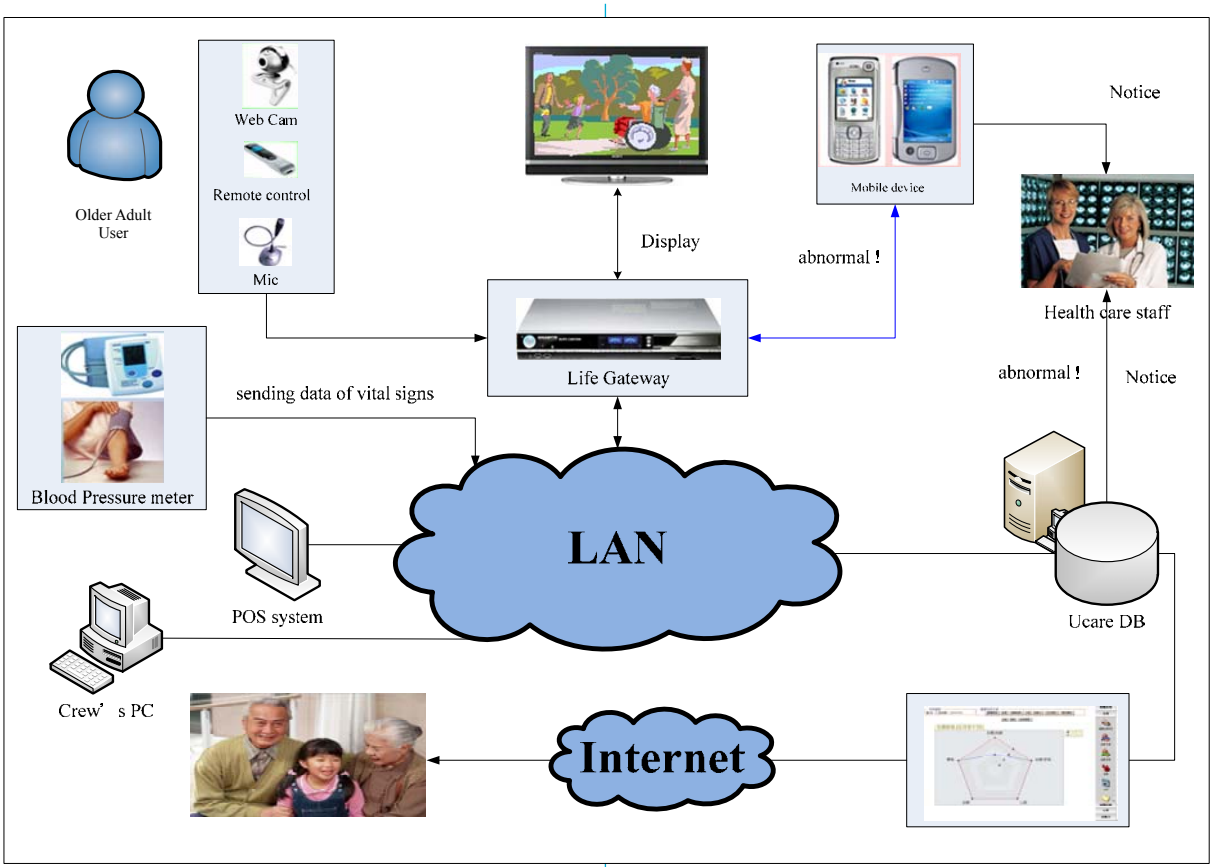

Figure-3: U-CARE system integration scenario

tem are nursing personnel and residents. The new LTISQ questionnaire was redesigned into an online MySurvey questionnaire. After it was completed, it was emailed to the nursing personnel. They were asked to set up the MySurvey online questionnaire system, fill in the questionnaire, and submit their responses. To collect the feedback of residents regarding their feelings when using the proposed system, because their TVs are all-in-one units with Internet functionality, when they turned on their TV, the default main page was displayed on the screen. They could select the functions they wanted to use from the page, including watching TV, listing the available activities, and retrieving their health education information. The questionnaire was also registered in the media center in paper format, allowing the researchers and the system development team to collect the personal survey information the residents filled in using their system screens. The following section describes the results of the subjective evaluations of the residents and system users and their objective measurements.

The evaluation result of the individual-level subjective satisfaction

The results from the satisfaction scale are summarized below based on the two types of participants: First, the results from the nursing personnel are listed in Table-4. In terms of system quality, information quality, and whether there was a positive effect on their organization, the responses from the nursing personnel were all positive. The nursing personnel were quite satisfied (75.3%) with the service quality of the subsystem functions, with an average score of at least 5% higher than those of the other aspects. One possible reason for this is that the nurses had previously participated in the system requirement phase and system analysis phase for the purpose of confirming the specific

requirements. However, their satisfaction with the interface operation was rather low (58.4%) because their information literacy was not high and they needed to accumulate more experience to improve their operation of the interface, which was brand new to them. In addition, according to the opinions of the nursing personnel, among the sub-functions provided, those that were the most helpful for care giving were customized health education, automatic collection of health information, and comprehensive health analysis used for fast communication with the family members. In addition, the scores given by the nursing personnel on improving their working efficiency and reducing working time were above 80%, meaning subjectively that the nursing personnel agreed that the U-CARE system can help them to save time spent on paperwork, and that they could use this time to improve their care for the residents.

Besides, the results from the residents themselves are also shown in Table-4. The residents were satisfied with the system performance in terms of system service, data service, and the service quality of each function. The results were similar to those of the nursing personnel. The highest score given by the residents was for service quality, which was 5% higher than the score given by the nursing personnel. This means that designing systems for nursing homes by integrating the body, mind, and soul is a good way to meet the actual requirements of the residents. However, because the residents are older people with low information literacy and are not familiar with how to operate a computer, their score given to the user interface was rather low (51.3%). Among the sub-functions provided, the residents believed the most helpful ones were the medication reminder and comprehensive health analysis. The residents were satisfied with the customized health education they received through the media center subsystem in their room, and the automatic display of their abnormal health conditions. They could get a sense of achievement by increasing their self-care without the nursing personnel, and by learning more medical knowledge to reduce lack of care related knowledge.

The evaluation results on the actual benefits of the system at the organizational level

This section presents the objective views on the improvements made for organizations or individuals using the U-CARE system. The evaluations were based on the system effects, including changes in the working procedures, influences on manpower and time costs, and organizational effects after the system was completed.

In the first part, the seven operations with the highest frequencies of occurrence in the work of the nursing personnel are compared in Table-5: health consultations and guidance, physiological measurements, life-and health -scale evaluations, emergency medical services, medicine delivery service, flu shots, and diet guidance. The actual operation time was measured to determine whether labor costs were reduced. The calculation of labor costs in this study was based on the average salary and working days of the nursing personnel in Taiwan. The effects from completing each of these operations on the organizations after the system implementation were calculated. The improvement methods for the operating procedures after the system implementation are presented one by one below. As a whole, the cost analysis shows

Table-4: Result of the individual-level subjective satisfaction

Construct	Satisfaction	
	Nursing personnel μ (%)	Resident μ (%)
System Quality	68.44	69.25
Data Quality	69.78	62.07
Service Quality	75.30	80.80
User interface	58.40	51.33
Organizational Impact	70.57	-

Table-5: Compared different of selected operations after the system implementation

Operation	Before Implementation (Paper-Based)	After Implementation (System –Based)
Health consulting and guidance	Proper instructions for resident health were selected through data comparisons by men. Arranging time for one-on-one health education and evaluation after education with residents was also done by men	Nursing personnel could directly set up connections between residents' health conditions and health education, and personalized materials would be assigned automatically for reading. Residents could read assigned materials through the media center at home and then fill the evaluation questionnaire afterwards to assess the effect of the health education.
Physiologic measurement	Nursing personnel had to record residents' self-measured values and check if there was anything abnormal through comparisons. Also, they had to find residents without measurements one by one to look for reasons and track them	After residents' measurements were done, the system could notify nursing personnel immediately of abnormal residents so they could put those residents on the high-risk list and start to monitor their conditions. If there were residents who did not complete measurements, the system could notify them through the media center. The system could also present hospital analysis data and trends to improve efficiency.
Life and health scale evaluation	Similar to physiologic measurement, nursing personnel needed to personally perform measurements for 9 scales including ADL and conduct interviews with residents one by one annually. It was time consuming.	Based on the concept of scheduling, interview time was defined. The system could send out notifications and perform measurements based on the schedule to save labor.
Emergency medical service	Nursing personnel had to actively identify residents who were not feeling well and determined whether to send them to hospitals. If a resident was hospitalized, his related information had to be recorded manually, with all the processes being put down in writing on the shift report sheet.	Through daily measurements, residents with abnormal health conditions could be identified earlier. During an outpatient visit, related recent health records could be summarized and provided to the doctor as references, in order to find unusual conditions as soon as possible for early treatments.
Medicine delivery service	Medicines were separated and put in medicine boxes manually. And residents who had problems following doctors' advices were reminded manually one by one to take medication.	The system would automatically remind residents to take medication. Residents could press the reply button after actually taking their medication as confirmation. In case of any questions related to medication, residents could access the pharmacopoeia in the system to inquire about appearances, dosages, applicable diseases, and doctors' reminders related to certain medicines, to avoid taking medication improperly.
Vaccination	Residents were notified manually to have outpatient visits. Also outpatient visit schedules were arranged manually and results were documented manually. It took a lot of time and efforts.	All events were pre-set through scheduling and all required information was generated automatically.
Guidance of diet	Dietitians hired by institutions could only passively provide interventions to abnormal patients. Manually tracking was time consuming. And it was difficult to clearly know how residents' actual diet conditions were.	Dietitians could set up the relationships between nutrition of foods and drinks on menus and diseases in advance, so that residents could get personalized suggestions on menus. They could change their diet habits through personalized suggestions and reminders.

that a system using U-CARE provides a cost-effective alternative to paper-based operation job lists, particularly in the operation of diet guidance, physiological measurements, and life and health scale evaluation. Table-5 lists a comparison of the job lists for before and after the system implementation and Table-6 lists the time and cost savings.

The second part is related to the residents' actual health conditions. The U-CARE system integrates various types of healthcare information of the residents. Through this medium, the residents' health literacy can be improved indirectly, allowing the residents to measure their own physiological state, participate in their own health care, and reduce their chances of hospitalization to serve the purposes of measuring physiologic information, caring about one's own health, and reducing chances of hospitalization. Therefore, three indexes are selected which including the rate of blood-pressure self-measurements, the rate of blood-sugar self-measurements, and the rate of unplanned transfers for hospitalization, to determine whether the health of the residents at the studied institution had improved after the system was implemented. The results showed that, after the system was implemented, the rate of blood pressure self-measurements increased by 3%, the rate of blood-sugar self-measurements increased by 5.3%, and the rate of unplanned transfers for hospitalization decreased by 0.022%. Hence, implementing the UCARE system can help residents value their own health care more and improve their overall health quality. It was also proved that the UCARE system implementation has a positive effect on nursing institutions. A summary of the difference pre and post implementation is listed in Table-7.

Conclusion

Faced with the advent of an aging society and the trend toward smaller families, it is becoming necessary to have foster institutions take care of older adults' family members rather the families themselves. Nevertheless, there are too many paperwork and too heavy workload, some patient problem identifications or evaluations were ignored which bring many near misses or medical errors of nursing personnel were happened in older adults care institution or nursing homes. In Taiwan, the government has developed various IT systems to

Table-6: Comparison of the time spent on various task before/after the system implementation

Operations	Before system implementation (min)a	After system implementation (min)b	a-b min(%)	Labor cost saved
Health consulting and guidance	55.50	11.50	44.00 (79.28)	172.48
Physiologic measurement	84.50	10.25	74.25 (87.80)	291.06
Life and heath scale evaluation	113.50	63.66	49.84 (43.91)	195.37
Emergency medical service	100.50	73.66	26.84 (26.71)	105.21
Medicine delivery service	95.00	80.00	15.00 (15.79)	58.80
Vaccination	89.40	57.00	32.40 (36.20)	127.00
Guidance of diet	120.00	28.00	92.00 (76.67)	360.64
Total	658.40	324.07	1759.93 (84.40)	1310.57

Table-7: Compared between the index pre and post implementation

Index of resident's health management	Before the system implementation	After the system implementation	Difference
Rate of blood pressure self-measurement	86.70%	90.00%	+3.30%
Rate of blood sugar self-measurement	87.70%	93.00%	+5.30%
Rate of unplanned transfer for hospitalization	.10%	.07%	-.03%

solve the problem of manpower shortage in these institution, and one such system is the UCARE system described herein. However, the information system implement projects are still high rate failure especially in the health care related institution.

A good long-term information system can not only meet the demands of end users, but also achieve the goal of IT implementation in organizations before sufficient scientific-based subjective and objective evaluations can be conducted. In particular, older adults care in nursing homes has focused on a solution to the problem of resident care, and evaluated how well an information system can change the health of the nursing home residents. In addition, the cost is another point of concern because the scale of a nursing home is smaller than that of a general hospital. Therefore, the development of a reasonable and practical evaluation approach for older adults care institution or nursing homes is needed.

It was not long ago when IT implemented in the field of heath care. Such implementation in older adults care institutions has just begun. Compared with large hospital, small institutions like older adults care institutions are rather to get the IT systems to help increase efficacy of their work. However, it is insufficient to gauge system effectiveness with focus solely on managers and end-user satisfaction, similar to previously conducted research. It would be more reasonable to take into account objective data, such as actual improvement measures based on cost and health improvements, in evaluations and comparisons.

As a whole, the contributions of this study include: providing a diversified way to evaluate a system's successful implementation in a nursing institution for the elderly; introducing the functions of the implemented system in a holistic way in the evaluated institution; performing actual measurements and evaluations of subjective satisfaction and objective data, and lastly, proving that a satisfactory system can efficiently help nursing personnel save time on paperwork-based operations, reduce mistakes and errors, and manage the health care of the older adult residents in a more efficient way. Although IT implementation in the fields of nursing and healthcare has been rather late compared with acute medical institutions, this study will allow future researchers to have an enhanced understanding of this field.

Despite this study showed competitive multiple evaluation framework is very important and helpful for evaluating an integrated application system in a nursing institution. There were still some limitations during the system implementation. (1) The nursing personnel in the case institution were used to operating their own personal computers, and thus had some problems accepting the integrated information system. Consequently, they possessed a lack of confidence in using computer-based operations over paper-based operations. (2) During the implementation, it took time to test the system, and the willingness of the some nursing personnel were influenced for their increasing workload, maybe it influenced measurement results. (3) The institution's willingness to implement the system was influenced by their real investment quantity. (4) The security of the residents' personal information was a key factor for promoting the system.

Conflict of Interests

The authors declare that there is no conflict of interests or any source of finding in the article.

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