



A comparative study on the Functional Independence and Quality of Life (QoL) of Filipino elderly in Telehealth and Traditional Healthcare

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Abstract

Background/Objectives: Telehealth through videoconferencing has the potential to improve the lives of the elderly. Unfortunately, little is known on its health benefits in the physical and quality of life dimensions among seniors. The aim of this paper is to compare videoconferencing as a mode of telehealth with traditional healthcare delivery in the contexts of functional independence and Quality of Life (QoL) measures using a non-equivalent control group before-after quasi experimental design. **Methods/Statistical analysis:** One-hundred forty seniors from a rural area were purposively selected and distributed to the telehealth (n=82) and traditional (n=58) groups. SF-8 and Functional Independence Measure (FIM) were used to gather the needed data from the participants before and after exposure to the interventions. **Findings:** Results of t-tests indicate significant improvement in QoL of the two groups of subjects on both telehealth and traditional groups, while FIM measures exhibited no significant change among the telehealth group. **Improvements/Applications:** On the whole, study findings promote a more personal delivery of healthcare among the elderly, and challenges the health practitioners and policy makers to recognize the pragmatic worth of and improve telehealth as a complementary healthcare tool for traditional consultation in enhancing QoL among seniors. Impliedly, more researches with extended number of subjects and locale is needed to come up with a more generalizable result.

Index Terms

Telehealth, Videoconferencing, Functional Independence, Quality of Life (QoL), Elderly, Philippines

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- Manuscript received February 6, 2019.
- Revised February 26, 2019 ; Accepted March 25, 2019.
- Date of publication March 31, 2019.

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I. INTRODUCTION

Telehealth, or healthcare delivery at a distance, is believed to have gained popularity in the contemporary society and is reflected to be one of the fastest growing areas in healthcare provision (Ruggiero, Sacile & Giacomini, 1999 cited in Brownsell, 2009; Glasper, 2011). Its continuous existence can be seen from the application of diverse health technology platforms. DelliFraine and Dansky (2008), for their part, revealed that Telehealth is commonly employed through the use of telephone, internet, data monitor, and video monitor. In some situations, Telehealth exists as simple as webcam-to-webcam discussions, yet it can be very complex by amalgamating multiple channels and devices together (Maeder, 2010). Among the platforms of Telehealth, the use of videos in web-based communication (videoconferencing) is considered the most popular (Durrani & Kohja, 2009) and most effective (DelliFraine & Dansky, 2008).

Telehealth through videoconferencing has attracted a considerable interest among researchers and has been a mainstream topic in the health sciences. Most if not all studies confirmed that the use of videoconferencing produces desirable results in the management of various health conditions. Notably, adults in a study with co-occurring insomnia and depression experienced significant improvement after exposure to series of cognitive behavioral therapy through Telehealth videoconferencing (Lichstein, Scogin, Thomas, DiNapoli, Dillon & McFadden, 2013). Quinones, Jimenez and Coleman (2013), for their part, discovered that video-based Telehealth intervention can improve pressure ulcer healing and produce high degree of satisfaction among patients. Although much of Telehealth studies were done in developed countries, few researches have been made in the context of developing nations (Brownsell, 2009; Koch, 2006).

Telehealth offers a lot of potentials in addressing numerous health challenges of the ageing population, more importantly on the improvement of functional status and maintaining high Quality of Life (QoL). On the one hand, functional status pertains to the ability in performing daily activities independently (Grodzicki, Kocemba & Skalska, 2006; Cignac & Cott, 1998). McNeil (1997) indicated that more than half of the elderly reported at least some difficulty in performing one or more functional activities and about one-third requires assistance in at least one activity or instrumental activity of daily living. On the other hand, Quality of Life (QoL) is a multidimensional concept that encompasses the physical, emotional, and social components associated with health status of an individual (O'Connor, 2004). It is considered as an important

parameter of health intervention effectiveness (Lin, Wolf, Hwang, Gong, & Chen, 2007), and a desirable outcome of health policies (Farquhar, 1995). In general, the process of aging is generally associated with a decline in both functional status and QoL, which are frequently reported as the greatest sources of fear among older adults (Rice, 2003; Kirchengast & Haslinger, 2008). Interestingly, scholars have discovered a strong connection between functional independence and QoL (Patrick, Engelberg & Pearlman, 2000; Reardon, Lareau & ZuWallack, 2006; Avlund, Damsgaard, Runtala, Laukkanen & Schroll, 2002; Stenner, Cooper & Skevington, 2003).

So far, there are no direct evidence that health promotion through video-based Telehealth will result to better functional independence and Quality of Life (QoL) among seniors when compared to the traditional mode. Similarly, no previous research attempts have been made comparing videoconferencing with traditional consultation delivery (Dellifraime & Dansky, 2008). In response to the foregoing, and call for further Telehealth research and exploration (Pountney, 2009; Brownsell, 2009; Demiris, et al, 2009; Sorrells et al, 2006; Milligan, et al, 2011), this paper aimed to compare the effects of video-based Telehealth and traditional consultation sessions relative to the measures of functional independence and QoL among a select group of elderly in a developing country. Results of the study are expected to pinpoint the other benefits of Telehealth that are vital in developing policies and standards in promoting health among the elderly.

II. RESEARCH METHOD

A. Research Design

This study adopted the non-equivalent control group before-after quasi experimental design (Polit & Beck, 2008), which involves an experimental treatment and two groups of subjects observed before and after implementation. Although true experimental designs can offer a solid foundation in establishing telehealth practice among elderly, quasi-experimental design provides an advantage of an indirect manipulation of variables (Goba, Balfour & Nkmabule, 2011) to explore the effects of telehealth sessions in a elder-friendly manner than in typical laboratories as seen in true experimental designs. This allowed delivery of the telehealth sessions with ease and comfort to the aging participants.

B. Study Sites and Subjects

The selected participants are residing in a rural area with more than 160,000 residents dispersed in 16 local government units. More than 15,000 registered seniors comprise the 10% of the total

population in the area. Two (2) secondary hospitals and sixteen (16) small community health centers provide basic health services to its constituents. Fortunately, four (4) companies provide phone and internet access in the locality.

The study intended to have two (2) groups of participants, namely (a) telehealth group (experimental) and (b) traditional group (control), with one-hundred (100) randomly selected elderly per grouping. The inclusion criteria for both groups were as follows: (a) has not been diagnosed with chronic disease for the last 5 years, (b) physically-able, (c) mentally sound, and (d) recently under the conventional mode of consultation program. These parameters entailed to safeguard the quality and integrity of collected data, but they also restricted the sourcing of elder participants. This led to the downsizing of the target number of participants in both telehealth (n=82) and traditional (n=58) groups.

The control group (n=58) engaged in their regular healthcare consultations in the community setting for a month, whereas the experimental group (n=82) successfully passed the basic computer training for elderly (Kehoe et al, 2009) prior to one month of telehealth session exposure. As part of the research design, the study collected pre and post assessments for better analysis and benchmark. The elder participants remained intact throughout the study with no research mortality and attrition. Ethical clearance was provided by the Institutional Ethics Research Committee.

C. Instrumentation and DataCollection.

The following measures were used:

Functional Independence Measure (FIM).

The FIM tool by the national task force in the United States (Cournan, 2009), was created to develop a universal language for describing function and outcomes (Cournan, 2011). It is one of the most widely used tools in the both developed and developing countries (Black, 1999; Ottenbacher, Hsu, Granger & Fliedler, 1996). There is a significant body of research on the reliability, validity and responsiveness of the FIM (Chau, Daler, Andre & Patris, 1994; Kwon, Hartzema, Duncan & Min-Lai, 2004; Cohen & Marino, 2000; Grey & Kennedy, 1993) wherein it is proven commendable for research use. FIM consist of 18 items with two subscales: motor (13 items) and cognitive (5 items). Each item is given a score of 1-7, wherein the lower the score the more dependent, the higher the score the more independent (Choo, Umraw, Gomez, Cartotto & Fish, 2006).

Short-Form Health Survey (SF-8). The SF-8 is a widely used measure of quality of life assessment, and it serves as an excellent example of

the type of scales employed in assessment of older people because of its established validity and reliability (Garman & Cohen, 2002). The SF-8 is an 8-item questionnaire that measures each of the eight domains of health included in the former tool SF-36. The license for the use of the Filipino-translated tool was acquired through QualityMetric. It takes several minutes to complete and can be administered by self, proxy or interviewer (Ware, 1995). In this case, the researchers administered the SF-8 through face-to-face interview. Results of the test were tallied and scored using the QualityMetric SF-8 Scoring Software.

D. Data Analysis

FIM and SF8 scores of the traditional and telehealth groups undergone hypothesis testing for significant difference using paired t-test and t-test for independent sample features of SPSS version 21. Paired t-test was beneficial in determining the intervention effectiveness within group based on its pre and post assessment data. This grants valuable information on the status changes in the participants' functional independence and health-related quality of life (HRQoL) as a result of the intervention given (i.e. telehealth group with telehealth session, and traditional group with standard intervention – regular consultation). In terms of between group comparison, t-test for independent sample provide a crucial analysis to compare and contrast the telehealth and traditional groups in terms of their (a) baseline and (b) health status (i.e. functional independence and QoL).

III. RESULTS

A. Respondents' Profile

Table 1. DEMOGRAPHIC PROFILE OF RESPONDENTS

Profile	Telehealth (n=82)		Control (n=58)	
	f	%	f	%
Gender				
Male	23	28	18	31
Female	59	72	40	69
Age				
60 - 66	52	63	23	40
67 - 73	24	29	23	40
>73	6	7	12	21
Civil Status				
Married	51	62	27	47
Single	6	7	5	9
Widowed	25	30	26	45
Household				
Parents	19	23	1	2

Siblings	18	22	2	3
Children	36	44	42	72
Grandchildren	33	40	27	47
Others	27	33	15	26
Income				
< 10,000	46	56	50	86
10,000 – 20,000	23	28	5	9
20,000 – 30,000	8	10	1	2
30,000 – 40,000	4	5	0	0
40,000 – 50,000	1	1	0	0
> 50,000	0	0	0	0
Source of Income				
Job	5	6	10	17
Work Family Members	38	46	12	21
Own Business	0	0	14	24
Family Business	2	2	2	3
Pension	37	45	17	29
Others	12	15	8	14
At home				
With Computer	55	67	21	36
With Internet	34	41	17	29

Table 1 describes the participants' characteristics in telehealth (n=82) and control (n=58) groups. More than half of the participants from both groups are female (72% and 69%, respectively). Further, 62% of the participants belonging to the telehealth group, and 47% in the latter are married. This may establish the household composition of the telehealth (44%) and control (72%) groups living with their children.

telehealth groups have computers and internet access. Notably, only 36% own a computer among the control groups.

B. Comparative Statistics in the Functional Independence (FI) and Quality of Life (QoL) of Telehealth and Control Groups

Table 2A. SIGNIFICANT DIFFERENCES IN THE PRETEST RESULTS ON FUNCTIONAL INDEPENDENCE OF TELEHEALTH AND CONTROL GROUPS

Functional Independence Measures	Telehealth (N=82)		Control (N=58)		t value
	x	SD	x	SD	
Self-Care	6.86	0.29	6.27	0.44	9.66*
Sphincter Control	6.65	0.51	6.38	0.49	3.12*
Transfers	6.86	0.31	6.24	0.43	9.85*
Locomotion	6.51	0.58	6.35	0.49	1.70
Communication	6.80	0.37	6.32	0.52	6.44*
Cognition	6.50	0.49	6.34	0.47	1.89
Overall	6.73	0.29	6.31	0.33	8.17*

*significant at $\alpha < .05$

Results of t-test for independent samples (Table 2A) indicate that the telehealth group is more functionally independent in all measures ($x=6.73$, $SD=0.29$) than the control group ($x=6.31$, $SD=0.33$). Notably, marked significant differences in the pretest results on self-care ($t=9.66$), sphincter control ($t=3.12$), transfers ($t=9.85$) and communication ($t=6.435$) dimensions of functional independence were noted, except for locomotion ($t=1.70$) and cognition ($t=1.89$).

Table 2B SIGNIFICANT DIFFERENCES IN THE PRETEST RESULTS ON QUALITY OF LIFE (QoL) OF TELEHEALTH AND CONTROL GROUPS

Quality of Life (QoL) Attributes	Telehealth (N=82)		Control (N=58)		t value
	x	SD	x	SD	
Physical Component Score (PCS)	44.91	8.14	44.40	8.20	0.37
Mental Component Score (MCS)	47.87	7.44	49.85	6.89	1.59

*significant at $\alpha < .05$

The pre-assessment of the Quality of Life (QoL) of the telehealth and control groups is shown in Table 2B. Remarkably, the telehealth group posted better physical ($x=44.91$, $SD=8.14$) and mental ($x=47.97$; $SD=7.44$) component scores as compared to the control group PCS ($x=44.40$, $SD=8.20$) and MCS ($x=49.85$, $SD=6.89$). However, t-test for independent samples indicated no marked differences since the computed t-values are greater than 0.05.

Meanwhile, 56% and 86% of the telehealth and control

C. Comparative Statistics of the Pretests and Posttest Results on Functional Independence and Quality of Life (QoL)

Paired t-test was used to compare the differences between pretests and posttest scores on Functional Independence and Quality of Life (QoL). Table 3A indicates that there are no significant differences ($t=0.88$) in the pretest ($x=6.73$; $SD=0.29$) and posttest ($x=6.65$; $SD=0.84$) results on the functional independence measures of the telehealth group. However, significant differences were noted on the physical ($t=2.58$) and mental ($t=2.18$) component scores. These differences were significant at 0.5 level, indicating improvement in the Quality of Life (QoL) among the members of the group after exposure to the intervention.

Table 3A. SIGNIFICANT DIFFERENCES IN THE PRETEST AND POSTTEST ON FUNCTIONAL INDEPENDENCE AND QUALITY OF LIFE (QoL) OF TELEHEALTH GROUP

Functional Independence and Quality of Life (QoL)	Pretest		Posttest		t value
	x	SD	x	SD	
Functional Independence Measures					
Self-Care	6.86	0.29	6.73	0.84	1.52
Sphincter Control	6.65	0.51	6.53	1.13	0.94
Transfers	6.86	0.31	6.72	0.90	1.43
Locomotion	6.51	0.58	6.60	1.05	0.71
Communication	6.80	0.37	6.62	0.99	1.51
Cognition	6.50	0.49	6.57	0.96	0.62
Overall	6.73	0.29	6.65	0.84	0.88
Quality of Life Attributes					
Physical Component Score (PCS)	44.91	8.14	47.52	7.07	2.58*
Mental Component Score (MCS)	47.87	7.44	49.99	7.53	2.18*

*significant at $\alpha < .05$

Table 3B depicts the higher functional independence ($x=6.89$, $SD=0.26$) and Quality of Life (QoL) attributes, namely: PCS ($x=53.14$, $SD=7.47$) and MCS ($x=54.14$, $SD=7.47$), among the respondents under the control group after exposure to intervention. Further, significant differences were noted at 0.05 level, for functional Independence measures on self-care ($t=7.47$), sphincter control ($t=8.31$), transfers ($t=10.82$), locomotion ($t=6.81$), communication ($t=8.62$), and cognition ($t=8.31$). The table also revealed significant differences at 0.05 level on the Quality of Life attributes, namely: PCS ($t=6.91$) and MCS ($t=4.81$)

Table 3B. SIGNIFICANT DIFFERENCE IN THE PRETEST AND POSTTEST ON FUNCTIONAL INDEPENDENCE AND QUALITY OF LIFE (QoL) OF CONTROL GROUP

Functional Independence and Quality of Life (QoL)	Pretest		Posttest		t value
	x	SD	x	SD	
Functional Independence Measures					
Self-Care	6.27	0.44	6.88	0.49	7.54*
Sphincter Control	6.38	0.49	6.94	0.23	8.31*
Transfers	6.24	0.43	6.91	0.28	10.82*
Locomotion	6.35	0.49	6.88	0.33	6.81*
Communication	6.32	0.52	6.94	0.23	8.62*
Cognition	6.34	0.47	6.84	0.34	8.19*
Overall	6.31	0.33	6.89	0.26	11.05*
Quality of Life Attributes					
Physical Component Score (PCS)	44.40	8.20	50.64	5.05	6.91*
Mental Component Score (MCS)	49.85	6.89	53.14	7.47	4.81*

*significant at $\alpha < .05$

D. Comparative Statistics in the Posttest Results on Functional Independence and Quality of Life (QoL)

Table 4A. SIGNIFICANT DIFFERENCES IN THE POSTTEST RESULTS ON FUNCTIONAL INDEPENDENCE OF TELEHEALTH AND CONTROL GROUPS

Functional Independence Measures	Telehealth (N=82)		Control (N=58)		t value
	x	SD	x	SD	
Self-Care	6.73	0.84	6.88	0.49	1.22
Sphincter Control	6.53	1.13	6.94	0.23	2.73*
Transfers	6.72	0.90	6.91	0.28	1.61
Locomotion	6.60	1.05	6.88	0.33	1.94
Communication	6.62	0.99	6.94	0.23	2.41*
Cognition	6.57	0.96	6.84	0.34	2.05*
Overall	6.65	0.84	6.89	0.26	-2.41

*significant at $\alpha < .05$

As shown (Table 4A) members of the control group posted higher scores for functional independence measure ($x=6.65$, $SD=0.84$) as compared to the telehealth group ($x=6.89$, $SD=0.26$). Significant differences were noted on sphincter control ($t=2.73$), communication ($t=2.41$) and cognition ($t=2.05$) dimensions, but not on self-care ($t=1.22$), transfers ($t=1.61$), and locomotion ($t=1.94$).

Table 4B. SIGNIFICANT DIFFERENCE IN THE POSTTEST RESULTS ON QUALITY OF LIFE (QoL) ATTRIBUTES OF TELEHEALTH AND CONTROL GROUPS

Quality of Life (QoL) Attributes	Telehealth (N=82)		Control (N=58)		t value
	x	SD	x	SD	
Physical Component Score (PCS)	47.52	7.07	50.64	5.05	2.88*
Mental Component Score (MCS)	49.99	7.53	53.14	7.47	2.45*

*significant at $\alpha < .05$

As displayed in Table 4B, the control group posted higher physical ($x=50.64$, $SD=5.05$) and mental ($x=53.14$; $SD=7.47$) component scores than the telehealth group's PCS ($x=47.52$, $SD=7.07$) and MCS ($x=49.99$, $SD=7.53$). There are significant differences, at 0.05 level of significance, in the post physical ($t=2.88$) and mental ($t=2.45$) component scores of the two groups.

IV. DISCUSSION

A. Comparative Statistics in the Functional Independence (FIM) and Quality of Life (QoL) of Telehealth and Control Groups

Through the use of FIM, this study revealed a more functionally independent group of seniors under telehealth as compared to the traditional cohort. Functional assessment through the use of FIM is a classical technique in determining seniors' physical and cognitive performance (Black, 1999) and their state of dependence or independence in the conduct of daily life activities (Deutsch, Braun & Gagner, 1996). Notably, previous researchers (Porell & Miltiades, 2002; Mor, Wilcox, Rakowski & Hiris, 1994) provided concrete evidences supporting the strong connection between functional assessment measure and socio-demographic attributes. Therefore, FIM outcomes of the present study may be explained by socio-demographic differences of the participants. For example, the result of studies (Mor, Wilcox, Rakowski & Hiris, 1994; Guralnik, LaCroix, Abbot, Berkman, Satterfield, Evans & Wallace, 1993) claiming that functional status declines as age progresses may provide the reason why the telehealth group comprising of more younger seniors aged 60-66 are more functionally independent than the traditional group. In the same sense, lower FIM scores of the traditional group may be attributed to the participants' family structure (i.e. mostly living with children) and social statuses (i.e. single and widowed). Waite and Hughes (1999), for their part, found that unmarried individuals experienced functional decline. The presence of children serving as primary caretakers to the elderly (Jocano, 2001; Medina, 2001), may further result to higher dependence among seniors. It is parsimonious to infer that the bilateral family structure in the Philippines may serve as a significant reference in developing telehealth programs to improve functional independence among seniors. Filipino children who co-reside and support (Agree, Biddlecom, Chang & Perez, 2002; Yamauchi & Tiongco, 2012), and have high deference to their senior parents (Varona, Saito, Takahashi & Chai, 2006) can function as a collaborator during health consultation sessions and a potential source of rich healthcare data of seniors within the household. Healthcare providers need to consider the important role of significant others as care partners for the improvement of health of the gerontologic population.

It was also observed that the baseline FIM assessments of both groups revealed significant differences on self-care, sphincter control, transfers and communication dimensions. These findings may be attributed to the range of health concerns of the individual respondents, which is associated with the common issues related to decrease in biological activity common to the elderly (Muszalik, Dijkstra, Kornatowska & Wieczkowska, 2012; Dirik, Cavlak & Akdag, 2006). Gignac and Cott (1998), for their

part, explained that individuals respond to disparate external forces which further shape their individual state of health. The differences in the functional dimension of the respondents strongly enforce gerontologic healthcare that are both distinct and universal. First, distinctiveness in healthcare underlines that every senior shall be considered as a unique persona by healthcare providers and therefore requiring person-specific and condition-specific care. Second, universality in healthcare shall address functional problems that are pervasive to the elderly cohort regardless of seniors' social status and regional differences.

Results of the study also showed no significant differences in the baseline PCS and MCS scores of the QoL between the two groups. This finding appears to be incoherent with the initial expectations, since previous researchers (Hauer, Pfisterer, Weber, Wezler, Kliger & Oster, 2003; Bize, Johnson & Plotnikoff, 2007) have established a direct link between physical performance and QoL. That is, if significant differences were obtained from the dimensions of FIM, same patterns are expected for QoL scores. However, previous literature suggests that some elderly with physical function issues may still achieve better QoL if coping strategies will be operationalized (Freund & Baltes, 1998), and the person's psychological resources are functional (Murphy, Cooney, Shea & Casey, 2008). Though senior respondents vary in terms of physical status, their QoL communicates inter-group homogeneity in reference to perceived physical and mental well-being. Therefore, QoL components may offer a more stable indicator for telehealth outcomes than the attributes of FIM. Evaluating the physical dimension with mental assessment shall play an important role in assessing health intervention outcomes like that of the telehealth.

B. Comparative Statistics of the Pretests and Posttest Results on Functional Independence and Quality of Life (QoL)

Results indicate that telehealth activities displayed no significant effects on FIM assessments. A plausible explanation rests upon the expected limitations of telehealth interventions in addressing a complete physical assessment which normally requires personal service and direct encounter between the health provider by the elderly client. Therefore, the need for further technological advancements in telehealth equipment in which the healthcare provider can indirectly carry out effective physical examinations in the absence of physical presence is necessary. Based on a prior research (Gale & Sultan, 2013), extension devices must be added to telehealth interfaces to maximize telehealth benefits. Promising examples were discussed in the

study of Kang, Mahoney, Hoenig, Hirth, Bonato, Hajjar and Lipitz (2010) such as smart fabric and smart phone-based monitoring technologies which are still in development to date. Instituting telehealth centers integrating physiologic monitoring systems may be included as an infrastructure agenda among health regulating bodies.

Although telehealth interventions may struggle in solving the physical health concerns of the elderly, it can be a potential channel to deliver better health understanding and empowerment as evidenced by improvement in their QoL dimensions after exposure to telehealth. Several researchers (Braithwaite, Waldron & Finn, 1999; Milligan, Roberts & Mort, 2011) explained that the sense of affiliation experienced by participants from an online support group may be translated into feelings of personal empowerment, and has the potential to serve as a complementary component of therapeutic change (Meier, 2005; Norcross, 2006). Hjelm (2005), for his part, believed that telehealth can serve as an acceptable alternative to healthcare in cases of under-served rural populations due to distance to the health facility and local deficiencies in specialist care. An example was provided by Chanda and Shaw (2010), when they shared Zambia's experience in establishing a national telehealth program to augment unequal access to healthcare in rural communities. Henceforth, telehealth interventions may serve as a commendable follow-up to personal healthcare delivery, and a decent solution to augment unequal access to healthcare in rural regions. Literature also suggests that developing countries are the potential benefactors of telehealth programs due to its cost efficient operating cost (Darkins & Cary, 2000; Hjelm, 2005; Sorrells, Tschirch & Liong, 2006; Miller, 2007; Maeder, 2010).

Notably, FIM measures and QoL attributes had significantly improved among the participants under the traditional group as compared to the telehealth group. The aging population seems to prefer a more personal interaction with their healthcare providers, since a number of them are still baffling in using computers (Kehoe, Bednall, Yin, Olsen, Pitts, Henry & Baily, 2009). This is supported by Hjelm (2005), Stowe and Harding (2010) who explained that seniors feel diffident to communicate with the healthcare providers appearing on screen-like media (e.g. TV and computer monitors) as influenced by their previous one-way communication experiences from these devices. Hence, Suler's (2004a, 2004b) phenomenon of *online disinhibition effect* (or the free and uninhibited expression of oneself) seems not existent among seniors from their interaction with the telehealth providers on-screen. Interestingly, senior respondents from the study of Sanders et al (2012) considered telehealth participation as connotations of old age, sickness and extreme health

dependency. In light of the foregoing analysis, a preliminary physical encounter with the telehealth providers may be necessary for orientation purposes, and for the provider to establish rapport with the client prior to succeeding virtual encounters in telehealth. Strengthening policies related to telehealth contract may be viewed as a necessary requirement. Also, a substantial reminder that health consultations delivered through telehealth channels may be in the form of promotive care rather than purely preventive and curative is acutely imperative. Through this, the notion and branding of helplessness and dependency to the provider among the client side will be minimized.

C. Comparative Statistics in the Posttest Results on Functional Independence and Quality of Life (QoL)

In this study, elderly respondents from the telehealth group elicited significant positive scores for FIM attributes and QoL assessments than those in the telehealth group. This result is in contrast with the previous claim (e.g. DelliFraine & Dansky, 2007) indicating that telehealth interventions can produce clinically similar care when compared with traditional consultation. Accordingly, results in this area further clarify the worthiness of traditional healthcare as a standard practice for the elderly. Therefore, it is parsimonious to infer that traditional consultation provides the gold standards of care among the elderly respondents. There is need for telehealth programs to mimic traditional consultation and make it more life-like before it can occupy a considerable space for mainstream healthcare initiatives for the aged. However, the expidiousness of telehealth is considered as an advantage over traditional consultation. Olano, Hidalgo, Diaz, Gallego, Castaño, Cascales and Puime (2006) averred that an individual's decision to use healthcare services is also based on the availability of the healthcare offer, among others. If promotive healthcare may be achieved in the comfort of seniors' home, the physically-challenged elderly might consider the deftness of virtual consultation. Elderly preference for telehealth might open doors for possible curricular and training enhancement for healthcare providers in both undergraduate and professional levels. In the Philippines, the inclusion of informatics course within healthcare programs is viewed as both instrumental and constructive in shaping new competencies required of a health professional. Nourishing professionals to deliver quality and congruent healthcare service in personal and virtual contact with the client is a challenge.

V. CONCLUSION

This experimental study tested the difference in the empowerment effect of Telehealth and traditional consultation sessions in the context of FIM and QoL measures among a select group of seniors in the Philippines. Overall, results showed that QoL attributes in both telehealth and traditional groups yielded higher significant after scores, and FIM measures exhibited no significant change among the telehealth group. Although this study promotes a more personal delivery of elderly healthcare, it also challenges the health practitioners and policy makers to recognize the pragmatic worth of telehealth as a complementary healthcare tool in enhancing QoL among seniors.

The merit of this paper rests in bringing forth crucial evidences in support of the global initiative to develop further telehealth programs for the elderly. Further, it provided an excellent ground on the growing influence of information and communications technology in the area of gerontologic healthcare practice. As telehealth practice becomes more prominent, additional researches are essential to develop a more responsive telehealth policies and programs in reinforcing evidence-based practices.

Despite the practical and empirical strengths of telehealth, the present findings require thoughtful interpretations in the light of the following limitations. The confinement of the research in a rural area in the Philippines may intern understanding to a specific setting, which may not be representative of developing countries. Enlistment of more participants with transcended geographical boundaries is highly recommended. Subsequently, understanding of the firsthand data obtained from the study may be further authenticated by a qualitative approach in research.

ACKNOWLEDGMENT

The authors wish to thank the Commission on Higher Education, Millenia 2025 and the Our Lady of Fatima University for their support to the project.

REFERENCES

- [1] Agree, E. M., Biddlecom, A. E., Chang, M.-C., & Perez, A. E. (2002). Transfers from older parents to their adult children in Taiwan and the Philippines. *Journal of Cross-cultural Gerontology*, 17(4), 269–294.
- [2] Amichai-Hamburger, Y., McKenna, K. Y. A., & Tal, S.-A. (2008). E-empowerment: Empowerment by the Internet. *Computers in Human Behavior*, 24(5), 1776–1789.
- [3] Artinian, N. T., Washington, O. G. M., & Templin, T. N. (2001). Effects of home telemonitoring and community-based monitoring on blood pressure control in urban African Americans: A pilot study. *Heart & Lung: The Journal of Acute and Critical Care*, 30(3), 191–199.
- [4] Aujoulat, I., d' Hoore, W., & Deccache, A. (2007). Patient empowerment in theory and practice: polysemy or cacophony? *Patient Education and Counseling*, 66(1), 13–20.
- [5] Avlund, K., Damsgaard, M. T., Sakari-Rantala, R., Laukkanen, P., & Schroll, M. (2002). Tiredness in daily activities among nondisabled old people as determinant of onset of disability. *Journal of Clinical Epidemiology*, 55(10), 965–973.
- [6] Barak, A., Boniel-Nissim, M., & Suler, J. (2008). Fostering empowerment in online support groups. *Computers in Human Behavior*, 24(5), 1867–1883.
- [7] Bellazzi, R., Arcelloni, M., Bensa, G., Blankenfeld, H., Brugués, E., Carson, E., ... Stefanelli, M. (2003). Design, Methods, and Evaluation Directions of a Multi-Access Service for the Management of Diabetes Mellitus Patients. *Diabetes Technology & Therapeutics*, 5(4), 621–629.
- [8] Benatar, D., Bondmass, M., Ghitelman, J., & Avitall, B. (2003). Outcomes of chronic heart failure. *Archives of Internal Medicine*, 163(3), 347–352.
- [9] Biermann, E., Dietrich, W., Rihl, J., & Standl, E. (2002). Are there time and cost savings by using telemanagement for patients on intensified insulin therapy? A randomised, controlled trial. *Computer Methods and Programs in Biomedicine*, 69(2), 137–146.
- [10] Bize, R., Johnson, J. A., & Plotnikoff, R. C. (2007). Physical activity level and health-related quality of life in the general adult population: a systematic review. *Preventive Medicine*, 45(6), 401–415.
- [11] Black, T M, Soltis, T., & Bartlett, C. (1999). Using the Functional Independence Measure instrument to predict stroke rehabilitation outcomes. *Rehabilitation Nursing: The Official Journal of the Association of Rehabilitation Nurses*, 24(3), 109–114, 121.
- [12] Black, Terrie M., Soltis, T., & Bartlett, C. (1999). Using the Functional Independence Measure Instrument to Predict Stroke Rehabilitation Outcomes. *Rehabilitation Nursing*, 24(3), 109–121.
- [13] Blissmer, B., Prochaska, J. O., Velicer, W. F., Redding, C. A., Rossi, J. S., Greene, G. W., ... Robbins, M. (2010). Common Factors Predicting Long-term Changes in Multiple Health Behaviors. *Journal of Health Psychology*, 15(2), 205–214.
- [14] Braithwaite, D. O., Waldron, V. R., & Finn, J. (1999). Communication of social support in computer-mediated groups for people with disabilities. *Health Communication*, 11(2), 123–151.
- [15] Breton, M. (1994). On the Meaning of Empowerment and Empowerment-Oriented Social Work Practice. *Social Work With Groups*, 17(3), 23–37.
- [16] Brownsell, S. (n.d.). Measuring the “success” of Telehealth Interventions. *Journal of Assistive Technologies*, 3(4), 12–20.
- [17] Chanda, K. L., & Shaw, J. G. (2010). The development of telehealth as a strategy to improve health care services in Zambia: Developing telehealth in Zambia. *Health Information & Libraries Journal*, 27(2), 133–139.
- [18] Chase, H. P., Pearson, J. A., Wightman, C., Roberts, M. D., Oderberg, A. D., & Garg, S. K. (2003). Modern Transmission of Glucose Values Reduces the Costs and Need for Clinic Visits. *Diabetes Care*, 26(5), 1475–1479.
- [19] Chau, N., Daler, S., Andre, J. M., & Patris, A. (1994). Inter-rater agreement of two functional independence scales: the Functional Independence Measure (FIM) and a subjective uniform continuous scale. *Disability and Rehabilitation*, 16(2), 63–71.
- [20] Choo, B., Umraw, N., Gomez, M., Cartotto, R., & Fish, J. S. (2006). The utility of the functional independence measure (FIM) in discharge planning for burn patients. *Burns*, 32(1), 20–23.

- [21] Cohen, M. E., & Marino, R. J. (2000). The tools of disability outcomes research functional status measures. *Archives of Physical Medicine and Rehabilitation*, 81(12 Suppl 2), S21–29.
- [22] Courman, M. (2011a). Use of the functional independence measure for outcomes measurement in acute inpatient rehabilitation. *Rehabilitation Nursing: The Official Journal of the Association of Rehabilitation Nurses*, 36(3), 111–117.
- [23] Courman, M. (2011b). Use of the functional independence measure for outcomes measurement in acute inpatient rehabilitation. *Rehabilitation Nursing: The Official Journal of the Association of Rehabilitation Nurses*, 36(3), 111–117.
- [24] Cowger, C. D. (1994). Assessing client strengths: clinical assessment for client empowerment. *Social Work*, 39(3), 262–268.
- [25] D’Souza, R. (2002). Improving treatment adherence and longitudinal outcomes in patients with a serious mental illness by using telemedicine. *Journal of Telemedicine and Telecare*, 8 Suppl 2, 113–115.
- [26] Darkins, A. W., & Cary, M. A. (2000). *Telemedicine and telehealth: principles, policies, performance, and pitfalls*. New York: Springer Pub. Co.
- [27] De Lusignan, S., Wells, S., Johnson, P., Meredith, K., & Leatham, E. (2001). Compliance and effectiveness of 1 year’s home telemonitoring. The report of a pilot study of patients with chronic heart failure. *European Journal of Heart Failure*, 3(6), 723–730.
- [28] DelliFraine, J. L., & Dansky, K. H. (2008). Home-based telehealth: a review and meta-analysis. *Journal of Telemedicine and Telecare*, 14(2), 62–66.
- [29] Demiris, G., Doorenbos, A. Z., & Towle, C. (2009). Ethical considerations regarding the use of technology for older adults. The case of telehealth. *Research in Gerontological Nursing*, 2(2), 128–136.
- [30] Deutsch, A., Braun, S., & Granger, C. (1996). The Functional Independence Measure and the Functional Independence Measure for Children: ten years of development. *Critical Reviews of Physical Medicine and Rehabilitation*, 8(4), 267–281.
- [31] Dirik, A., Cavlak, U., & Akdag, B. (2006). Identifying the relationship among mental status, functional independence and mobility level in Turkish institutionalized elderly: gender differences. *Archives of Gerontology and Geriatrics*, 42(3), 339–350.
- [32] Durrani, H., & Khoja, S. (2009). A systematic review of the use of telehealth in Asian countries. *Journal of Telemedicine and Telecare*, 15(4), 175–181.
- [33] Egner, A., Phillips, V. L., Vora, R., & Wiggers, E. (2003). Depression, fatigue, and health-related quality of life among people with advanced multiple sclerosis: results from an exploratory telerehabilitation study. *NeuroRehabilitation*, 18(2), 125–133.
- [34] Evers, A., Pijl, M. A., & Ungerson. (1994). *Payments for care: a comparative overview*. Aldershot, England; Brookfield, USA: Avebury.
- [35] Farquhar, M. (1995). Elderly people’s definitions of quality of life. *Social Science & Medicine* (1982), 41(10), 1439–1446.
- [36] Fernández-Olano, C., Hidalgo, J. D. L.-T., Cerdá-Díaz, R., Requena-Gallego, M., Sánchez-Castaño, C., Urbistondo-Cascales, L., & Otero-Puime, A. (2006). Factors associated with health care utilization by the elderly in a public health care system. *Health Policy (Amsterdam, Netherlands)*, 75(2), 131–139.
- [37] Feste, C., & Anderson, R. M. (1995). Empowerment: from philosophy to practice. *Patient Education and Counseling*, 26(1-3), 139–144.
- [38] Frangou, S., Sachpazidis, I., Stassinakis, A., & Sakas, G. (2005). Telemonitoring of Medication Adherence in Patients with Schizophrenia. *Telemedicine and e-Health*, 11(6), 675–683.
- [39] Frankle, R. T. (1976). Nutrition education in the medical school curriculum: a proposal for action: a curriculum design. *The American Journal of Clinical Nutrition*, 29(1), 105–109.
- [40] Freund, A. M., & Bales, P. B. (1998). Selection, optimization, and compensation as strategies of life management: correlations with subjective indicators of successful aging. *Psychology and Aging*, 13(4), 531–543.
- [41] Funnell, M. M., & Anderson, R. M. (2003). Patient Empowerment: A Look Back, A Look Ahead. *The Diabetes Educator*, 29(3), 454–464.
- [42] Gale, N., & Sultan, H. (2013). Telehealth as “peace of mind”: embodiment, emotions and the home as the primary health space for people with chronic obstructive pulmonary disorder. *Health & Place*, 21, 140–147.
- [43] Garman, K. S., & Cohen, H. J. (2002). Functional status and the elderly cancer patient. *Critical Reviews in Oncology/hematology*, 43(3), 191–208.
- [44] Gignac, M. A., & Cott, C. (1998a). A conceptual model of independence and dependence for adults with chronic physical illness and disability. *Social Science & Medicine* (1982), 47(6), 739–753.
- [45] Gignac, M. A., & Cott, C. (1998b). A conceptual model of independence and dependence for adults with chronic physical illness and disability. *Social Science & Medicine* (1982), 47(6), 739–753.
- [46] Glasper, A. (2011). Telehealth care - where is it going? *British Journal of Nursing (Mark Allen Publishing)*, 20(12), 714.
- [47] Grey, N., & Kennedy, P. (1993). The Functional Independence Measure: a comparative study of clinician and self ratings. *Paraplegia*, 31(7), 457–461.
- [48] Grodzicki, T., Kocemba, J., Skalska, A. (Eds.), 2006. *Geriatrics with Elements of General Gerontology*. Via Medica, Gdansk, (in Polish), pp. 6–12.
- [49] Guralnik, J. M., LaCroix, A. Z., Abbott, R. D., Berkman, L. F., Satterfield, S., Evans, D. A., & Wallace, R. B. (1993). Maintaining mobility in late life. I. Demographic characteristics and chronic conditions. *American Journal of Epidemiology*, 137(8), 845–857.
- [50] Hauer, K., Pfisterer, M., Weber, C., Wezler, N., Kliegel, M., & Oster, P. (2003). Cognitive impairment decreases postural control during dual tasks in geriatric patients with a history of severe falls. *Journal of the American Geriatrics Society*, 51(11), 1638–1644.
- [51] *Health behavior and health education: theory, research, and practice*. (2002) (3rd ed.). San Francisco: Jossey-Bass.
- [52] Hibbard, J. H., Stockard, J., Mahoney, E. R., & Tusler, M. (2004). Development of the Patient Activation Measure (PAM): Conceptualizing and Measuring Activation in Patients and Consumers: Development of the Patient Activation Measure (PAM). *Health Services Research*, 39(4p1), 1005–1026.
- [53] Hjelm, N. M. (2005). Benefits and drawbacks of telemedicine. *Journal of Telemedicine and Telecare*, 11(2), 60–70.
- [54] Ishimoto, Y., Wada, T., Hirosaki, M., Kasahara, Y., Kimura, Y., Konno, A., ... Matsubayashi, K. (2009). HEALTH-RELATED DIFFERENCES BETWEEN PARTICIPANTS AND NONPARTICIPANTS IN COMMUNITY-BASED GERIATRIC EXAMINATIONS: LETTERS TO THE EDITOR. *Journal of the American Geriatrics Society*, 57(2), 360–362.
- [55] James Kehoe, E., Bednall, T. C., Yin, L., Olsen, K. N., Pitts, C., Henry, J. D., & Bailey, P. E. (2009). Training adult novices to use computers: Effects of different types of illustrations. *Computers in Human Behavior*, 25(2), 275–283.
- [56] Jerant, A. F., Azari, R., & Nesbitt, T. S. (2001). Reducing the cost of frequent hospital admissions for congestive heart failure: a randomized trial of a home telecare intervention. *Medical Care*, 39(11), 1234–1245.
- [57] Kang, H. G., Mahoney, D. F., Hoenig, H., Hirth, V. A., Bonato, P., Hajjar, L., ... Center for Integration of Medicine and Innovative Technology Working Group on Advanced

- Approaches to Physiologic Monitoring for the Aged. (2010). In situ monitoring of health in older adults: technologies and issues. *Journal of the American Geriatrics Society*, 58(8), 1579–1586.
- [58] Kenwright, M., Marks, I., Marks, I. M., Gega, L., & Mataix-Cols, D. (2004). Computer-aided self-help for phobia/panic via internet at home: a pilot study. *The British Journal of Psychiatry: The Journal of Mental Science*, 184, 448–449.
- [59] Kirchengast, S., & Haslinger, B. (2008). Gender differences in health-related quality of life among healthy aged and old-aged Austrians: cross-sectional analysis. *Gender Medicine*, 5(3), 270–278.
- [60] Koch, S. (2006). Home telehealth--current state and future trends. *International Journal of Medical Informatics*, 75(8), 565–576.
- [61] Kwon, S. (2004). Disability Measures in Stroke: Relationship Among the Barthel Index, the Functional Independence Measure, and the Modified Rankin Scale. *Stroke*, 35(4), 918–923.
- [62] LaFramboise, L. M., Toderò, C. M., Zimmerman, L., & Agrawal, S. (2003). Comparison of Health Buddy with traditional approaches to heart failure management. *Family & Community Health*, 26(4), 275–288.
- [63] Leveille, S. G., Guralnik, J. M., Ferrucci, L., & Langlois, J. A. (1999). Aging successfully until death in old age: opportunities for increasing active life expectancy. *American Journal of Epidemiology*, 149(7), 654–664.
- [64] Lichstein, K. L., Scogin, F., Thomas, S. J., DiNapoli, E. A., Dillon, H. R., & McFadden, A. (2013). Telehealth cognitive behavior therapy for co-occurring insomnia and depression symptoms in older adults. *Journal of Clinical Psychology*, 69(10), 1056–1065.
- [65] Lin, M.-R., Wolf, S. L., Hwang, H.-F., Gong, S.-Y., & Chen, C.-Y. (2007). A randomized, controlled trial of fall prevention programs and quality of life in older fallers. *Journal of the American Geriatrics Society*, 55(4), 499–506.
- [66] Maeder, A. (2010). Telehealth and remote access. *Studies in Health Technology and Informatics*, 151, 239–254.
- [67] McNeil, J. (1997). Americans with disabilities: 1994-95. US Department of Commerce, Economics and Statistics Administration, Census Bureau.
- [68] Medina, B. T. G. (2001). *The Filipino family* (2nd ed.). Diliman, Quezon City: University of the Philippines Press.
- [69] Miller, E. A. (2007). Solving the disjuncture between research and practice: telehealth trends in the 21st century. *Health Policy (Amsterdam, Netherlands)*, 82(2), 133–141.
- [70] Milligan, C., Roberts, C., & Mort, M. (2011). Telecare and older people: who cares where? *Social Science & Medicine* (1982), 72(3), 347–354.
- [71] Mor, V., Wilcox, V., Rakowski, W., & Hiris, J. (1994). Functional transitions among the elderly: patterns, predictors, and related hospital use. *American Journal of Public Health*, 84(8), 1274–1280.
- [72] Murphy, K., Cooney, A., Shea, E. O., & Casey, D. (2009). Determinants of quality of life for older people living with a disability in the community. *Journal of Advanced Nursing*, 65(3), 606–615.
- [73] Muszalik, M., Dijkstra, A., Kędziora-Kornatowska, K., Zielińska-Więczkowska, H., & Kornatowski, T. (2011). Independence of elderly patients with arterial hypertension in fulfilling their needs, in the aspect of functional assessment and quality of life (QoL). *Archives of Gerontology and Geriatrics*, 52(3), e204–e209.
- [74] Norcross, J. C. (2006). Integrating self-help into psychotherapy: 16 practical suggestions. *Professional Psychology: Research and Practice*, 37(6), 683–693.
- [75] O'Connor, R. (2004). *Measuring quality of life in health*. Edinburgh; New York: Churchill Livingstone.
- [76] Ottenbacher, K. J., Hsu, Y., Granger, C. V., & Fiedler, R. C. (1996). The reliability of the functional independence measure: a quantitative review. *Archives of Physical Medicine and Rehabilitation*, 77(12), 1226–1232.
- [77] Patrick, D. L., Kinne, S., Engelberg, R. A., & Pearlman, R. A. (2000). Functional status and perceived quality of life in adults with and without chronic conditions. *Journal of Clinical Epidemiology*, 53(8), 779–785.
- [78] Polit, D. F., & Beck, C. T. (2007). *Resource manual to accompany Nursing research: generating and assessing evidence for nursing practice*. Philadelphia: Wolters Kluwer, Lippincott Williams & Wilkins.
- [79] Porell, F. W., & Miltiades, H. B. (2002). Regional differences in functional status among the aged. *Social Science & Medicine* (1982), 54(8), 1181–1198.
- [80] Pountney, D. (2009). Telecare and telehealth: enabling independent living. *Nursing & Residential Care*, 11(3), 148–151.
- [81] Purdie, N., & Boulton-Lewis, G. (2003). THE LEARNING NEEDS OF OLDER ADULTS. *Educational Gerontology*, 29(2), 129–149.
- [82] Quinones, E. C., Jimenez, Z., & Coleman, B. R. (2013). Improving Clinical Outcomes and Cost-Effectiveness in SCI through Clinical Video Telehealth (CVT): A Case Report. *PM&R*, 5(9), S242.
- [83] Rahkonen, O., & Takala, P. (1998). Social class differences in health and functional disability among older men and women. *International Journal of Health Services: Planning, Administration, Evaluation*, 28(3), 511–524.
- [84] Reardon, J. Z., Lareau, S. C., & ZuWallack, R. (2006). Functional status and quality of life in chronic obstructive pulmonary disease. *The American Journal of Medicine*, 119(10 Suppl 1), 32–37.
- [85] Redsell, M., & Nycyk, M. (2010). Skilling seniors in computers: community training responses to the digital divide. *Working with Older People*, 14(2), 38–42.
- [86] Rice, K. L. (2003). Geriatric best practices in nursing: optimizing functional independence. *Journal of Vascular Nursing: Official Publication of the Society for Peripheral Vascular Nursing*, 21(4), 151–152.
- [87] Rosenstock, I. M. (1966). Why people use health services. *The Milbank Memorial Fund Quarterly*, 44(3), Suppl:94–127.
- [88] Ruggiero, C., Sacile, R., & Giacomini, M. (1999). Home telecare. *Journal of Telemedicine and Telecare*, 5(1), 11–17.
- [89] Sanders, C., Rogers, A., Bowen, R., Bower, P., Hirani, S., Cartwright, M., ... Newman, S. P. (2012). Exploring barriers to participation and adoption of telehealth and telecare within the Whole System Demonstrator trial: a qualitative study. *BMC Health Services Research*, 12(1), 220.
- [90] Simon, G. E., Ludman, E. J., Tutty, S., Operskalski, B., & Von Korff, M. (2004). Telephone psychotherapy and telephone care management for primary care patients starting antidepressant treatment: a randomized controlled trial. *JAMA: The Journal of the American Medical Association*, 292(8), 935–942.
- [91] Sims, J., Kerse, N. M., Naccarella, L., & Long, H. (2000). Health promotion and older people: the role of the general practitioner in Australia in promoting healthy ageing. *Australian and New Zealand Journal of Public Health*, 24(4), 356–359.
- [92] Sorrells-Jones, J., Tschirch, P., & Liang, M. A. S. (2006). Nursing and telehealth: Opportunities for nurse leaders to shape the future. *Nurse Leader*, 4(5), 42–58.
- [93] Staples, L. H. (1990). Powerful Ideas About Empowerment. *Administration in Social Work*, 14(2), 29–42. Stenner, P. H., Cooper, D., & Skevington, S. M. (2003). Putting the Q into quality of life; the identification of subjective constructions of health-related quality of life using Q methodology. *Social Science & Medicine*, 57(11), 2161–2172.
- [94] Stowe, S., & Harding, S. (2010). Telecare, telehealth and telemedicine. *European Geriatric Medicine*, 1(3), 193–197.
- [95] Suler, J. (2004). The online disinhibition effect. *Cyberpsychology & Behavior: The Impact of the Internet, Multimedia and Virtual Reality on Behavior and Society*, 7(3), 321–326.

- [96] Tu, Y.-C., Wang, R.-H., & Yeh, S.-H. (2006). Relationship between perceived empowerment care and quality of life among elderly residents within nursing homes in Taiwan: a questionnaire survey. *International Journal of Nursing Studies*, 43(6), 673–680.
- [97] Unsar, S., & Sut, N. (2010). Depression and health status in elderly hospitalized patients with chronic illness. *Archives of Gerontology and Geriatrics*, 50(1), 6–10.
- [98] Van Uden-Kraan, C. F., Drossaert, C. H. C., Taal, E., Seydel, E. R., & van de Laar, M. A. F. J. (2009). Participation in online patient support groups endorses patients' empowerment. *Patient Education and Counseling*, 74(1), 61–69.
- [99] Van Uden-Kraan, C. F., Drossaert, C. H. C., Taal, E., Shaw, B. R., Seydel, E. R., & van de Laar, M. A. F. J. (2008). Empowering Processes and Outcomes of Participation in Online Support Groups for Patients With Breast Cancer, Arthritis, or Fibromyalgia. *Qualitative Health Research*, 18(3), 405–417.
- [100] Varona, R., Saito, T., Takahashi, M., & Kai, I. (2007). Caregiving in the Philippines: A quantitative survey on adult-child caregivers' perceptions of burden, stressors, and social support. *Archives of Gerontology and Geriatrics*, 45(1), 27–41.
- [101] Wählin, I., Ek, A.-C., & Idvall, E. (2006). Patient empowerment in intensive care—An interview study. *Intensive and Critical Care Nursing*, 22(6), 370–377.
- [102] Waite, L. J., & Hughes, M. E. (1999). At risk on the cusp of old age: living arrangements and functional status among black, white and Hispanic adults. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, 54(3), S136–144.
- [103] Wallerstein, N. (1993). Empowerment and health: The theory and practice of community change. *Community Development Journal*, 28(3), 218–227.
- [104] Ware, J. E. (1995). The Status of Health Assessment 1994. *Annual Review of Public Health*, 16(1), 327–354.
- [105] World Health Organization (2002). *Active ageing: A policy framework*.
- [106] Yamauchi, F., & Tiongco, M. (2013). Why women are progressive in education? Gender disparities in human capital, labor markets, and family arrangement in the Philippines. *Economics of Education Review*, 32, 196–206.