

Prevalence of Internet Use, Loneliness and Life Satisfaction and Their Associated Factors among Older Adults: A Cross-Sectional Study

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Abstract: The elderly population and their use of internet are increasing. The role of internet use by elderly in preventing loneliness and improving life satisfaction is an emerging topic. This study aimed to estimate the prevalence of internet use, life satisfaction and loneliness and their associated factors in older adults. A descriptive, cross-section study was carried out. The demographics characteristics, use of internet and its causes were collected from 384older adults. Validated Arabic versions of Satisfaction with Life Scales and Loneliness Scale were completed. Results showed that the prevalence of internet use, loneliness and satisfaction with life was 45.1, 86.5 and 21.4%; respectively. The independent predictors of internet use are above secondary and secondary education (AOR=9.6 &4.0; respectively), enough income (AOR=16.3), living alone, with family and with relatives (AOR=11.8, 43.7 & 2.2; respectively) and absence of chronic diseases (AOR=52.4). The independent predictors of loneliness are being of 65 years and more (AOR=8.9) and rural residence (AOR=2.7). The independent predictors of satisfaction with life are being male (AOR=1.5), secondary education (AOR=3.0), living with family and relatives (AOR=02 &6.7; respectively), internet use (AOR=22.5) and absence of loneliness (AOR=4.6). There is a statistical significant difference between both the total scores of loneliness and life stratification among internet user and non-user. Conclusions; loneliness is common among older adults while satisfaction with life is low. Internet use could contribute to less loneliness and more satisfaction with life.

Key words: Internet Use • Elderly People • Life Satisfaction and Loneliness

INTRODUCTION

Egypt, in the Middle East's is the most populous nation and the third most populous in Africa. Over the past few centuries, one of the primary characteristics of the Egyptian population is the gradual rise in the absolute and relative number of elderly individuals. The proportion of seniors in 2016 was 8.1% and is anticipated to be 9.2% in 2021 and 20.8% in 2050. This implies that by that moment approximately 20 million Egyptians will be classified as elderly; and they need more attention to their human requirements [1].

At any era, social interaction is a fundamental human need. However, older individuals in particular often have to suffer in solitude, as families and friends do not have sufficient time to care [2]. Furthermore, with growing age, the closest of mates gets lower and if the spouse dies

early, there is no need for older people to raise social reference per-sons. The scenario will be worsen due to worldwide population modifications [3]. Many elderly individuals are at danger of social isolation following social modifications in latest years. One in four older people is estimated to suffer from loneliness [4].

In addition, life satisfaction is a wide word that can be interpreted in a variety of ways. It is a measure of satisfaction, integrity and a feeling of comfort for the elderly population about how they once lived their lives. It is defined by a sense of purpose, personal growth, self-acceptation and a successful aging process [5].

The Internet is now increasing quickly and becoming simpler to access. It works as a significant part of the everyday lives of almost everyone, including the elderly [6]. Internet use can give fresh methods to stay in contact

with one's family and friends, decrease emotions of loneliness and involve the elderly in today's culture more strongly and equally [7].

Older adults often experience decreased social support, loneliness and lower levels of life satisfaction. Many of these struggles are the result of a loss of social interaction with the social networks that are essential to them. Information and communication technology (ICT) therefore makes use of promises to help them retain their social ties [8]. In addition, the participation of older adults on the Internet can assist them to attain active aging, adapt to modifications in subsequent life, gain comparable capacities to those of younger individuals and stay productive [9].

Gerontological nursing plays a significant role in helping elderly people discover methods to decrease emotions of isolation and loneliness as well as in

improving life satisfaction for older adults, which is not only essential for older adults themselves. It also has to do with improved mobility, less cognitive function [10] and lower expenses of healthcare [11] this will benefit society as a whole [12]. The use of technology must therefore be viewed as necessary and meaningful and related to the elderly's lifestyle. The gerontological nurse can also improve the learning and teaching of older adults by integrating technology in the care of elderly people, both well and ill [13].

To the best of our understanding, there is no study in Egypt to explore the use of the Internet by older people or their related factors; despite the quickly rising Internet usage rate in their daily lives. The purpose of this research was to estimate the prevalence of Internet use, loneliness and life satisfaction in older adults and their related variables.

MATERIAL AND METHODS

Populations and Method: This descriptive cross-sectional study was carried out in two elderly clubs namely; Elsaada and El-Amal clubs, over a period of six months beginning from August, 2018. Sample size was calculated using open epi program (Available at: <https://www.openepi.com/SampleSize/SSPropor.htm>). A previous study found that the prevalence rate of loneliness was about 48.5% [14]. With alpha error 5%, study power 80% and margin of error 5% then the sample size was 384.

Elderly were recruited consecutively from the attendants of the two elderly clubs.

The Following Data Were Collected:

- Demographic characteristics such as age, sex and marital status, level of education, occupation, monthly income and health history (e.g. type and duration of chronic disease).
- Internet use practices e.g. type, duration, causes and sources of using the internet.
- The Satisfaction with Life Scale (SWLS) is a short five-item instrument designed to measure global cognitive judgments of satisfaction with one's life. The queries were answered according to a seven-item scale of Likert-type, starting from one (Strongly Disagree) to seven (Strongly Agree). Completion usually needs about one minute of the subjects' time. The items from the SWLS were summed in order to make a total score. The total points possible were thirty five. A score of thirty five would indicate high levels of satisfaction with life [15].

Subjects indicate how much they agree or disagree with each of the five items using a seven-point scale that ranges from seven (Strongly agree) to one (Strongly disagrees).

Though scoring should be kept continuous (Sum up scores on every item), here are some cutoffs to be used as benchmarks: 31 - 35 extremely satisfied; 26 - 30 satisfied; 21 - 25 slightly satisfied; 20 Neutral; 15 - 19 slightly dissatisfied; 10 - 14 dissatisfied and 5 - 9 extremely dissatisfied. The scale was translated and tested for its content validity and reliability ($r=0.87$) by El-Gilany and Refaat Alam [16].

UCLA (University of California, Los Angeles) Loneliness

Scale: It was developed by Russell *et al.* [17] and used to measure loneliness among elderly people. It consists of 20 items. Responses were measured on 4-point Likert scale: (4) always, (3) sometimes, (2) rare and (1) never; the score was reversed in case of negative items (1, 5, 6, 9, 10, 15, 16, 19 and 20) with a total score 80. The total score was divided into:

- Low feeling of loneliness = 20 □ 40
- Mild feeling of loneliness = 40 □ 60
- High feeling of loneliness = 60 □ 80

The scale was translated and tested for its content validity and reliability ($r=0.87$) by Abdel-Salam [18].

Methods:

- An official letter was issued from the Faculty of Nursing, Mansoura University and forwarded to the manager of each Club.
- A pilot study was carried out on 10% of the study sample to evaluate the ambiguity, clarity and applicability of the tools. Accordingly, the necessary modifications were done.
- According to the schedule designed by the researchers, each older adult was interviewed individually after explaining the purpose of the study then the necessary data was collected using the study tools.
- The researchers collected data, three days a week on Saturday, Monday and Thursday from 10 am to 2 pm for a period of six months. The interview time of each elderly ranged from 20 to 30 minutes.
- Data collection started from August, 2018 to January 2019.

Ethical Considerations: A verbal consent from the elders to participate in the study was obtained after explanation of the study purpose. Privacy, confidentiality, anonymity and the right to withdraw at any time was assured.

Statistical Analysis: Data were collected, coded and analyzed using IBM SPSS version 16. Qualitative data were presented as number and percent. Chi-square test was done for comparison of categorical variables. Bivariate analysis was performed to find out factors contributing to PPE use and risk factors for accidents. Crude odds ratios (CORs) and their 95% confidence intervals were calculated. Significant associations in bivariate analysis were entered into multivariate logistic regression model to identify the independent predictors of PPE use and accidents. Adjusted ORs and their 95% confidence intervals were calculated. Quantitative data were summarized as mean and standard deviation and unpaired t-test was used for two group comparisons. P value ≤ 0.05 was considered statistically significant.

RESULTS

Table (1) shows that the prevalence of internet use among elderly was 45.1%. The independent predictors of internet use are above secondary and secondary education (AOR=9.6 & 4.0; respectively), enough income (AOR=16.3), living alone, with family and with relatives (AOR=11.8, 43.7 & 2.2; respectively) and absence of chronic diseases (AOR=52.4).

Table 1: Internet use by elderly and bivariate and logistic regression analysis of its associated factors

	Total	Internet use N (%)	COR (95%CI)	AOR (95%CI)
Overall	384	173(45.1)		
Age: 60-64 year	140	90(64.3)	3.5(2.3-5.4)***	
65 years & more	244	83(34.0)	1(r)	
Sex: Male	166	70(42.2)	0.8(0.5-1.2)	
Female	218	103(47.3)	1(r)	
Residence: Urban	239	122(51.0)	1.9(1.3-2.9)**	
Rural	145	51(35.2)	1(r)	
Marital status: Married	124	78(62.9)	6.1(2.9-12.7)***	
Widow	205	83(40.5)	2.4(1.2-4.9)**	
Divorced/single#	55	12(21.8)	1(r)	
Education:				
Above secondary	129	85(65.9)	25.1(10.7-58.8)***	9.6(3.3-28.0)***
Secondary	157	81(51.6)	13.9(6.0-31.8)***	4.0(1.5-10.6)**
Below secondary	98	7(7.1)	1(r)	1(r)
Income: Enough	275	150(54.5)	4.5(2.7-7.5)***	16.3(6.3-42.5)***
Not enough	109	23(21.1)	1(r)	1(r)
Living condition: Alone	109	64(58.7)	6.8(3.0-15.3)***	11.8(2.8-49.8)***
With family	98	68(69.4)	10.8(4.7-25.0)***	43.7(9.8-194.7)***
With relatives	125	32(23.6)	1.6(0.7-3.4)	2.2(0.5-9.3)
Elderly home	52	9(17.3)	1(r)	1(r)
Chronic diseases: No	104	95(91.3)	27.3(13.1-56.8)***	52.4(17.0-161.4)***
Yes	202	78(27.9)	1(r)	1(r)

#4 single COR=Crude odds ratio, AOR=Adjusted odds ratio

*** & ** Significant at $P \leq 0.05$, ≤ 0.01 , & ≤ 0.001 ; respectively.

Table 2: Frequency of internet use of elderly, reasons for use and non-use

	N (%)		N (%)
Frequency of use (384 elderly):		Uses of internet (173users)#:	
Never use	211(54.9)	Emailing	
Several times per month	9(2.3)	Read newspapers/books	22(12.7)
Once per week	41(10.7)	Watching videos/films	118(68.2)
Several times per week	23(6.0)	Seeking health information	148(85.5)
Daily use	100(26.0)	Online shopping	154(89.0)

Causes of never use (211 elderly):		Transportation	87(50.3)
No interest	123(71.1)	Mass media use	53(30.6)
Lack of skills	17(9.8)	Dealing with banks	143(82.7)
No computer/phone	22(12.7)	Learning resource	33(19.1)
Costly	49(28.3)		142(82.1)

Approach to internet (173 users)#:			
Mobile/smart phone	164(94.8)		
Laptop	48(27.7)		
Desktop	7(4.0)		
Tablet	70(40.5)		

#Categories are not mutually exclusive

Table 3: Loneliness of elderly and bivariate and logistic regression analysis of its associated factors

	Total	Loneliness N(%)	COR(95%CI)	AOR(95%CI)
Overall	384	333(86.5)		
Age: 60-64 year	140	98(70.0)	1(r)	1(r)
65 years & more	244	235(96.3)	11.2(5.2-23.9)***	8.9(4.1-19.7)***
Sex: Male	166	144(86.7)	1(r)	
Female	218	189(86.7)	1.0(0.5-1.8)	
Residence: Urban	239	197(82.4)	1(r)	1(r)
Rural	145	136(93.8)	3.2(1.5-6.8)***	2.7(1.2-6.2)*
Marital status: Married	124	101(81.5)	1(r)	
Widow	205	177(86.3)	1.4(0.8-2.6)	
Divorced/single#	55	55(100.0)	Undefined	
Education: Above secondary	129	94(72.9)	1(r)	
Secondary	157	141(89.8)	3.3(1.7-6.3)***	
Below secondary	98	98(100.0)	Undefined	
Income: Enough	275	240(87.3)	1(r)	
Not enough	109	93(85.3)	0.8(0.4-1.6)	
Living condition: Alone	109	88(80.7)	1(r)	
With family	98	75(76.5)	0.8(0.4-1.5)	
With relatives	125	118(94.5)	4.0(1.6-9.9)***	
Elderly home	52	52(100.0)	Undefined	
Chronic diseases: No	104	53(51.0)	1(r)	
Yes	202	280(100.0)	Undefined	
Internet use: No	211	211(100.0)	1(r)	
Yes	173	122(70.5)	Undefined	

COR=Crude odds ratio, AOR=Adjusted odds ratio

*.*** & *** Significant at $P \leq 0.05, \leq 0.01$ & ≤ 0.001 ; respectively.

Table 4: Life satisfaction of elderly and bivariate and logistic regression analysis of its associated factors

	Total	Satisfaction N(%)	COR(95%CI)	AOR(95%CI)
Overall	384	82(21.4)		
Age: 60-64 year	140	47(33.6)	3.0(1.8-3.0)***	
65 years & more	244	35(14.3)	1(r)	
Sex: Male	166	44(26.5)	1.7(1.05-2.9)*	1.5(1.1-1.8)***
Female	218	38(17.4)	1(r)	1(r)
Residence: Urban	239	59(24.9)	1.7(1.02-3.0)*	
Rural	145	23(15.9)	1(r)	
Marital status: Married	124	20(6.1)	0.8(0.3-1.7)	
Widow	205	51(24.9)	1.3(0.6-2.8)	
Divorced/single#	55	11(20.0)	1(r)	
Education: Above secondary	129	37(28.7)	5.2(2.2-12.3)***	3.6(0.9-14.1)
Secondary	157	38(24.2)	4.2(1.8-9.7)***	3.0(1.3-7.4)*
Below secondary	98	7(7.1)	1(r)	1(r)
Income: Enough	275	66(24.0)	1.8(1.01-3.3)*	
Not enough	109	16(14.7)	1(r)	
Living condition: Alone	109	32(29.4)	1(r)	1(r)
With family	98	16(16.3)	0.5(0.2-0.9)*	0.2(0.1-0.5)***
With relatives	125	34(27.2)	0.9(0.5-1.6)	6.7(2.4-18.2)***
Elderly home	52	0	Undefined	Undefined
Chronic diseases: No	104	51(49.0)	7.7(4.5-13.2)***	2.5(1.02-6.2)*
Yes	202	31(11.1)	1(r)	1(r)
Internet use: No	211	16(7.6)	1(r)	1(r)
Yes	173	66(38.2)	7.5(4.1-13.6)***	22.5(6.9-72.9)***
Loneliness: No	51	31(60.8)	8.6(4.5-16.2)***	4.6(1.5-13.9)**
Yes	333	51(15.3)	1(r)	1(r)

COR=Crude odds ratio, AOR=Adjusted odds ratio

*, ** & *** Significant at $P \leq 0.05$, ≤ 0.01 & ≤ 0.001 ; respectively

Table 5: Loneliness and life satisfaction score among internet users and non-users.

Item	Internet users (173)	Internet non-users (211)	P
Loneliness score	46.07±7.19	51.06±5.02	≤ 0.001
Life satisfaction score	23.57±3.70	20.62±3.34	≤ 0.001

Table (2) shows that more than half (54.9%) of the elderly never use internet and more two third (71.1%) of them report that the main cause for Internet nonuse was no interest. For those who use internet, mobile/ smart phone was the most common approach to internet reported by 94.8% of them. Seeking health information and watching videos were the most common reason for using internet among users represented 89 and 85.5%; respectively.

Table (3) shows that prevalence of loneliness among studied elderly was 86.5%. The independent predictors of loneliness are being of 65 years and more (AOR=8.9) and (rural residence (AOR=2.7).

Table (4) shows that only (21.4%) of the studied elderly were satisfied with life. The independent predictors of satisfaction with life are being male (AOR=1.5), secondary education (AOR=3.0), Living with family and relatives (AOR=02 & 6.7; respectively), internet use (AOR=22.5) and absence of loneliness (AOR=4.6).

Table (5) shows that there was a statistical significant difference between both the total scores of loneliness and life stratification among internet user and non-user

DISCUSSION

A growing proportion of Internet users are older adults, understanding the state of Internet use and the ways of their use has been evolved [19]. The prevalence of internet use among elderly in this study was 45.1%. In line with similar studies, Choi *et al.* [20] in USA, Gell *et al.* [21] in USA and Jaiswal *et al.* [22] in India showed that the prevalence of internet use among elderly was 50.6 42.7 and 50% respectively. In congruent with other studies [23, 24] younger age groups (60-64 years) were highly represented among the Internet users in this study. This may be due to as people grow older; they tend to withdraw from the Internet use because they have age related changes (color perception, decrease visual acuity

and problems in hearing) and psychological barriers (e.g., privacy issues, computer anxiety and online problems). One of the striking findings from this study was that the prevalence of internet use was higher in females than in males. This differs from previous studies, that reported a male preponderance [14] in Turkey, Berner *et al.* [25] in Sweden. This may be due to more females than males were endorsed in this study. However, Leelakulthanit [26] in Thailand indicate a female preponderance.

The present study showed that internet use among elderly was significantly associated with higher education and this is in agreement with Choi *et al.* [20] and Gell *et al.* [21] in USA. This may be due to high education suggests the type of job before retirement, that permit the elderly to use a computer, or it suggests increase in the desire to learn and communicate with other people. Moreover, Internet use among elderly was significantly associated with higher income in this study. This result in same line with, other studies carried out by Choi *et al.* [20] and James *et al.* [23] in Thailand. This may attributed to using Internet is costly requires recent phones and monthly paid checks to be connected with Internet.

In the current study; those who were using the Internet were more likely to live with family. The same finding was reported by Lustria *et al.* [27] in USA and Van Deursen *et al.* [24] in UK. There is probably due to dependency of elderly on learning Internet from family caregivers or may be due to have more income than those who live alone and thus easily internet use. Deteriorating health conditions can hinder older adults' use of technology or learning efforts [9]. Supporting this, the present study showed that presence of chronic diseases was associated with less use of the internet. This is consistent with Gell *et al.* [21] in USA and Jaiswal *et al.* [22] in India.

Loneliness is a common phenomenon in old age [28]. The likelihood of loneliness in this study was significantly associated with higher age and this is similar to the study done by Dahlberg *et al.* [29] and Djukanović *et al.* [30]. This is likely due age associated losses (Loss of health, spouse, status and work) which affect relations and precipitate isolation.

Living in rural area was a significant predictor of loneliness in this study. Research findings have been inconsistent; some studies indicate higher level in urban areas [31, 32] others show greater level in rural areas [33, 34]. In this study, sex did not affect loneliness and this similar to Arslantaş *et al.* [35] in Turkey and Tomstad *et al.* [36] in Norway. In contrast, Hazer and Boylu [37] in Turkey, Ahmed [38] in Egypt and Dahlberg

et al. [29] in Sweden. These different results may be attributed to that loneliness is experienced subjectively and may result from dissatisfaction in human relationships or unmet social needs. Loneliness is also less expressed in societies where social relationships and traditional structures are conversed like Egypt. Therefore, it is difficult to provide comparisons between societies.

Contrary to previous studies in which life satisfaction increases with age [39] in USA and Uppal and Barayandema [40] it decreased with advancing age in the current study. This may be due to advancing age associated with multiple losses in physical health, more chronic diseases and disabilities that affect their satisfaction with life. This finding is consistent with Celik *et al.* [41] and Karadag *et al.* [42] in Turkey. Regarding sex, the present study revealed significant high level life satisfaction in male. Literature findings also supported the current result [41,42] in Turkey. Conversely, Uppal and Barayandema [40] in Canada found higher levels of life satisfaction in senior women. Higher education was significantly associated with higher life satisfaction in this study. Similar results were reported by Hsu [43] in Taiwan, Zhang *et al.* [39] in USA, Karadag *et al.* [42] in Turkey. This may be related to education leads to having higher probabilities of employment and to enjoying increased earnings which can contribute to person's satisfaction.

Moreover, presence of chronic diseases was another significant predictor for life satisfaction in this study. Chronic diseases bring many problems such as pain, lack of sleep, difficult social life and regular use of drugs which are difficult for elderly to cope with these physical or social restrictions life dissatisfaction occur. Literature findings also supported the current results Suh [44] in Korea, Gana *et al.* [45] in France, Lim *et al.* [46] in Korea. In contrast, Enkvist *et al.* [47] in Sweden and Celik *et al.* [41] in Turkey showed that health changes do not influence the life satisfaction of older adults.

According to the logistic regression model, loneliness was a significant predictor for life satisfaction. This result was supported by the study of Gutiérrez *et al.* [48] in Spain and Didino *et al.* [49] in Russia. This may be attributed to that loneliness itself is a state of dissatisfaction occurs when social network decreases in either quality or quantity and affect life satisfaction [50].

Finally, a statistical significant difference regarding mean score of loneliness and life satisfaction among Internet users and non-users was found. This may be due to using the Internet made elderly able to communicate with family and friends which enhance older adults' social interaction, increase self-esteem and decrease

loneliness and thus report more satisfaction with life. According to the findings obtained from others research [51] in Finland and James *et al.* [23] and Cotton *et al.* [52] in USA, which concluded that old people using internet have lower loneliness levels than those who don't. Also, Leelakulthanit [26] in Thailand and Tian *et al.* [53] in China showed that Internet users are more satisfied with their lives.

CONCLUSIONS

Loneliness is common among older adults while satisfaction with life is low. Internet use could contribute to less loneliness and more satisfaction with life.

Recommendations:

- Based on these results, providing trainings and necessary opportunities for computer and internet use to increase awareness among older people would be beneficial in increasing their socialization.
- Older people need training highlighting the importance of changing older people's misconceptions about computers, better informing them about what they are, what they can do and how they can be of real practical internet use.
- The benefits of Internet use need to be marketed to older people in a way that reflects their needs and aspirations.

Limitations: this study was cross-sectional data; the results of this study indicate associations between key measures but should not be seen as reflective of causal relationships. Also, the sampling method used, which was convenience sampling, highlighting the need of longitudinal study with large sample size. Being an institutional-based study its results cannot be generalized to community-dwelling elderly not attending elderly clubs.

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