Original Article

Evaluating Daily Cell-Phone Use in Elderly and its Effect on Lifestyle, Isfahan Comprehensive Health Care Centers

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Abstract

Background: The seniors' lifestyle is an important public-health issue. Hence, assessing the association of cell phone use as a rapidly spreading technology on older adults' lifestyle can be useful for planning prevention and health-promotion policies.

Materials and Methods: This cross-sectional study was conducted from March 2020 to March 2021 in Isfahan Comprehensive Health Care Centers to investigate the impact of cell phone use on the lifestyle of the elderly. The Cell-Phone Over-Use Scale and the lifestyle checklist were the assessment tools employed for this purpose.

Results: Of the 300 participants with a mean age of 67.93 ± 5.14 years, 46% were male and 54% female. The average value of cell phone usage score was 47.88 ± 26.56, which was categorized into low 36%, moderate 41%, and overuse 23%. A positive and significant correlation was reported between the level of cell phone use in males (β =10.711, [0.95 confidence interval {CI} =4.262–17.160]) and people who have used a substance or opium in the past year (β =10.819, [0.95 CI = 3.677–17.961]). The present results found no significant association between cell phone use patterns and age, level of education, body mass index, television time, sports time, smoking in the past year, marital relationship, and living alone.

Conclusion: In this study, we demonstrated a correlation between cell phone use and some demographic and lifestyle variables, namely sex and drug abuse.

Keywords: Cell phone, elderly, lifestyle

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Introduction

The world's population is getting older, and its numbers are actually increasing over time. By 2024, the number of people aged 65 years or older will be greater than the number of children under 5. The population aging will continue and even accelerate due to declining birth rates and a remarkable increase in life expectancy. The number of people aged 65 years or older is projected to increase from an estimated 524 million in 2010 to nearly 1.5 billion in 2050, with developing countries accounting for most of this increase.[1]

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The Iranian population has also taken a similar trend as the world population. In the 2011 census, it was reported that the birth rate dropped to 1.29%. In addition, life expectancy in Iran increased dramatically from 54.67 years in 1980 to 75.5 years in 2015. These two factors have accelerated the aging of the population. According to forecasts, the percentage of the aging population will increase to 10.5% in 2025 and 21.7% in 2050.[2,3]

As people age, their need for health care and social support increases. For this reason, it is only logical that a large proportion

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of countries' resources will be devoted to this population group, which will grow in size over time. In developing countries today, the increase in chronic, noncommunicable diseases such as heart disease, cancer, and stroke mirrors lifestyle and dietary changes, and in particular, the aging of the population[4-6] providing care to all of these people is costly and not economically feasible in the long term. The development of a range of lifestyle interventions (e.g., healthier diets, physical activity, tobacco, and alcohol control) and preventive medical interventions that counteract the accumulation of metabolic and molecular damage with age are warranted to halt or at least postpone this unstoppable demographic crisis of increased chronic disease, disability, and escalating health care costs.[6-8]

Given these facts, it is clear that policies to promote the health of older people and reduce the costs associated with old age are of great importance, with modern technologies able to play an important role in this regard. Even though seniors consistently have lower rates of technology use than the general public, this group is more digitally connected than ever. Since 2013, the percentage of adults 65 and older who own a smartphone has increased by 24% points in the United States. In fact, about half of older adults who own a cell phone now have some type of smartphone, compared to just 23% in 2013.[8] Recent advances in digital technology have converted the modern cell phone from what was once considered a single-use device into a multifunctional device with capabilities similar to a computer with an Internet connection. Today's cell phones allow users to make phone calls, send and receive text messages, update social networks, stream videos and live events, play video games, search the Internet, and more recently, communicate with medical professionals almost anytime, anywhere, which in turn can improve autonomy and self-care, and social life.[9]

The integration of digital technology into daily life has become a cultural norm. Cell phones, which keep us constantly connected to a variety of digital media, are the devices that enable the integration of technology and life.[10,11] The elderly population is considered an important target group for the impact of cell phones on different aspects of lifestyle. In this study, we aim to evaluate the daily use of cell phones and its correlation with some aspects of lifestyle in the elderly age group in terms of various activities and related demographic indicators.

Materials and Methods

This cross-sectional study was conducted from March 2020 to March 2021 in comprehensive health-care centers in Isfahan. The aim of this project was to investigate the relationship between cell phone use and elderly lifestyle variables.

Participants

The sample size was determined based on the Heshmati *et al*. study[12] by G*Power software Version 3.1.9.4 (Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany), and considering the statistical power of 95%, a medium effect size (d = 0.50), an alpha of 0.05, and 15% possible samples dropout. We obtained 310 participants aged over 60 years who owned and used a cell phone who had the ability of reading and writing and accepted give consent to continue the collaboration.

- We selected participants by a simple random sampling method by random number table from four Isfahan comprehensive health care centers affiliated to Isfahan University of Medical Sciences; Ibn Sina, Shahid Rostamian, Shahid Rezaian and Kerdabad comprehensive health-care centers. We excluded the participants who refused to give consent to continue the collaboration. We also excluded the incomplete questionnaires and the questionnaires with more than 20% unclear content.

Procedures

We explained the process of the study and the questionnaire and checklist to the seniors who were willing to participate in the study. All participants made a conscious decision to participate in the survey and gave their informed consent. They were then asked to complete the questionnaire and checklist. The researcher read the questions to the illiterate participants and recorded their responses. We pointed out that in these cases, the researcher should remain neutral and not express their personal opinions. All of these procedures were done in person.

The Cell-Phone Over-Use Scale is a questionnaire for assessing pathological cell phone use whose validity and reliability have been confirmed. This questionnaire was developed based on the Diagnostic and Statistical Manual of Mental Disorders-4 with 23 items in 6-item Likert format: 1 - never, 2 - almost never, 3 - sometimes, 4 - often, 5-almost always, and 6 - always. According to the total score, cell phone use can be low (score below 25), moderate (score between 74 and 26), and overuse (score above 75).[13]

Eshaghi *et al*.[14] translated and validated the elderly lifestyle questionnaire to assess lifestyle patterns in the Iranian population. The first part of this questionnaire addressed general biographical data (age, sex, education level, and current occupation), followed by 46 questions in five domains, including exercise, diet, prevention, stress management, and relationships. Respondents rated each question using a 5-point Likert scale; 1 - strongly disagree, 2 - disagree, 3 - neither agree nor disagree, 4 - agree, and 5 - strongly agree. The row score ranges from 35 to 175 and higher scores indicate healthier lifestyle.[15]

Data analysis

SPSS software version 20.0 (SPSS Inc, Chicago, IL, USA) was used to analyze the data. The continuous and categorical variables were described by means, standard deviation (SD), and percentages, respectively. We also used the Chi-square test and one-way analysis of variance to measure the degree of association between independent variables (sex, age, level of education, body mass index (BMI), television time, sports time, smoking in the past year, drug use in the past year, marital relationship, and living alone) and response variable (cell phone use pattern). After examining the data

normality assumption (Shapiro–Wilk test, $P = 0.051$ and Kolmogorov–Smirnov test, $P = 0.054$), the present study used the linear regression model to estimate parameters and confidence interval of 95% in the case of cell phone use pattern. A $P < 0.05$ was considered statistically significant.

Ethical considerations

The Medical Research Ethics Committee of Isfahan University of Medical Science approved this cross-sectional study (approval code: IR.MUI.MED.REC.1399.319). In the informed consent form, we explained the study procedure in detail. We also assured participants that their data would be kept absolutely confidential and that they would not have to write their names on the forms.

Results

We included 310 participants in this study, of whom two refused to participate and eight questionnaires were incomplete, so this study was conducted with 300 participants (males: 46% and females: 54%) (response rate: 96.7%).

The average age of the study group was 67.93 ± 5.14 years (mean ± SD). In terms of educational level, the proportion of participants with high school diploma and moderate cell phone use was higher than for the other education levels (48 = 39%).

Analysis of cell phone usage patterns revealed that 36% of our participants belonged to the low user group. In addition, 41% and 23% were classified as moderate and over users, respectively. The mean value of cell phone use score in this population was estimated to be 47.88 ± 26.56 (mean ± SD).

In Table 1, we summarized the relationship of cell phone use with sex, age, education level, and BMI. The results showed a significant association between sex, education level, and cell phone use ($P < 0.05$).

Table 2 shows the data on lifestyle variables in relation to our participants' cell phone use. The analysis showed that cell phone use was not correlated with television-watching time, exercise time, marital relationship, and loneliness ($P > 0.05$). However, the use of cigarettes, hookah, and other types of tobacco and substance or opium use was significantly higher in the group with moderate cell phone use ($P < 0.05$).

Table 3 shows the linear regression model for the association of sex, age, level of education, BMI, television time, sports time, smoking in the past year, drug use in the past year, marital relationship, and loneliness with the mean value of cell phone use. The results show that some of these demographic and lifestyle parameters are relevant to cell phone use. Cell phone use had no relationship with age, level of education, BMI, television time, sports time, smoking in the past year, marital relationship, and loneliness. In addition, there was a significant positive association between the mean value of cell phone use and male sex and substance or opium use in the past year ($P < 0.05$).

Discussion

We aim to assess the association of cell phone use as a rapidly spreading technology on some aspects of older adults' lifestyle.

The growth of the elderly population in the world, especially in developing countries such as Iran, requires planning new approaches to improve their lifestyles and reduce the costs imposed on society and the economy. The phenomenon of aging has many negative impacts on health and places a heavy burden on health services and social support networks.[6]

Older people have recently become more and more accustomed to new technologies such as the Internet, cell phone, or smartphone. However, there are still some older adults who have no or very limited relationship with this modern life.[16] The same holds true for our study, the majority of seniors use their cell phone more than moderately.

Our study population, females accounted for 54% of the total study population, but there was a significant positive association between the male sex and the mean value of cell phone use. In a cohort study (ORCATECH Life Laboratory Cohort), similarly, females comprised 88% of the study population, but the daily number of calls was positively associated with female sex.[17] In addition, two other studies

Table 1: Cell phone use association with demographic variables

Variables	Cell phone use pattern			*P*
	Low	Moderate	Overuse	
Sex, *n* (%)				
Female	58 (53.7)	79 (64.2)	25 (36.2)	0.001
Male	50 (46.3)	44 (35.8)	44 (63.8)	
Education level, *n* (%)				
Primary education or lower	40 (37.0)	29 (23.6)	12 (17.4)	0.037
High school diploma	34 (31.5)	48 (39.0)	23 (33.3)	
Undergraduate	22 (20.4)	26 (21.1)	24 (34.8)	
Postgraduate or higher	12 (11.1)	20 (16.3)	10 (14.5)	
Age, mean (SD)	68.21 (5.38)	67.72 (5.21)	67.88 (4.59)	0.800
BMI, mean (SD)	27.31 (3.56)	28.08 (3.25)	28.11 (3.09)	0.151

SD: Standard deviation, BMI: Body mass index

Table 2: Descriptive information (the mean and frequency) of lifestyle variables in the study population and its association with cell phone use

Life style variables	Cell phone use pattern			*P*
	Low	Moderate	Overuse	
Television-watching time, mean (SD)	5.95 (0.96)	5.98 (0.98)	5.71 (1.02)	0.155
Exercise time, mean (SD)	31.37 (11.14)	30.23 (11.20)	30.07 (9.65)	0.653
Smoking, hookah, or other tobacco use in the previous year, *n* (%)	78 (72.2)	88 (71.5)	61 (88.4)	0.019
Substance or opium use in the previous year, *n* (%)	72 (66.7)	85 (69.1)	59 (85.5)	0.016
Having a marital relationship, *n* (%)	72 (66.7)	85 (69.1)	43 (62.3)	0.632
Living alone, *n* (%)	27 (25.0)	24 (19.5)	12 (17.4)	0.417

SD: Standard deviation

Table 3: The association between independent variables with the mean use of cell phone using the linear regression model

Independent variables	Raw coefficients	Standardized coefficients	CI of coefficients	*t*	*P*
Age	−0.279	−0.056	−0.899-0.341	−0.888	0.376
BMI	0.553	0.075	−0.358-1.465	1.196	0.233
Sex (reference: female)	10.711	0.208	4.262-17.160	3.272	0.001
Education (reference: primary education or lower)	1.938	0.075	−1.347-5.223	1.162	0.246
Television-watching time	−0.518	−0.020	−3.679-2.643	−0.323	0.747
Exercise time	0.001	0.000	−0.296-0.297	0.001	0.999
Smoking, hookah, or other tobacco use in the previous year (reference: no)	6.486	0.109	−1.042-14.015	1.697	0.091
Substance or opium use in the previous year (reference: no)	10.819	0.190	3.677-17.961	2.984	0.003
Having a marital relationship (reference: no)	1.068	0.019	−5.890-8.026	0.302	0.763
Living alone (reference: no)	−4.352	−0.068	−12.427-3.723	−1.062	0.289

BMI: Body mass index, CI: Confidence interval

confirmed this cohort findings regarding the association between sex and cell phone use.[18,19] On the other hand, a study of Japanese aged 65 years and older reported that men used cell phones more frequently than women.[20]

The data obtained from the questionnaires showed that the lifestyle of older people was not statistically significantly affected by cell phone use.

Several studies have examined the lifestyle benefits of technology for older people and assessed its impact on their health and social indicators such as stress levels, loneliness feeling, and depression, potentially leading to improved and more accessible social communication, care assistance in emergencies, and physical and mental well-being.[18,19,21] However, there is little literature on assistive technologies for aging based on controlled studies. Therefore, there is a need to study the topic more thoroughly to achieve a patient-centered approach to the development, implementation, and evaluation of technologies that support aging in place.[22]

In our study, we can briefly say that as cell phone use increases by elderly who living alone, although this was not significant statistically. This could be related to the fact that nowadays the Internet and cell phones make our communication much easier and help us to connect more socially with others. It may be a positive lifestyle point for older people to direct their use of technology toward improving their psychological and mental health.

According to the study conducted by Minagawa *et al*., cell phone use was associated with lower levels of depressive symptoms among older Japanese women. They suggest that among the many benefits brought by recent technological developments, cell phones appear to be an important contributor to the psychological well-being of older Japanese.[20]

The present results show that cell phone use is not correlated with smoking and marital relationship quality. However, substance or opium use was negatively affected by cell phone use. It can be assumed that behavioral problems can cause a tendency to develop different forms of addiction, namely opium, substances, and cell phone addiction.

Petersen *et al*. sought to demonstrate the effectiveness of objective measures of loneliness and social isolation using a telephone monitoring device compared with an assessment of these outcomes based on self-report, which can be susceptible to bias. In general, lower levels of loneliness feeling were found among those who used more cell phones. They showed that patterns of phone use among older adults may be an objective assessment tool for measuring feelings of loneliness.[17]

In another study, Alhassan *et al*. reported on the negative aspects of smartphones in the lives of adults in a cross-sectional study. In their study, there was a significant positive linear relationship between smartphone addiction and depression. However, it is relevant to bear in mind that smartphone addiction scores were significantly higher in younger users than

in older smartphone users. In addition, high school educated users had a higher risk of developing depression compared to the college-educated group and users with higher smartphone addiction scores.[23]

Study limitation

Unfortunately, in the absence of information about participants' lifestyles before using the cell phone and about changes after the cell phone was introduced into their lives, it is unclear whether the use of the cell phone influenced their lifestyles or cell phone use was affected by their primary behavioral and habitual characteristics. The timing at which the cell phone was first introduced into their lives also influences the final results. In addition, because of the different capabilities of smartphones and regular cell phones, it would have been better if the participants had been divided into two groups and evaluated separately, which is not the case in the present study.

Suggestion

It is suggested that similar studies be conducted on a larger scale to specifically examine how mobile capabilities can be applied to every aspect of older people's lives and meet their physical and mental needs. For example, research should be conducted on how specific mobile applications can be used to improve the healthy and beneficial relationships of seniors with support groups, or the application of mobile software in health care, prevention, and treatment services, which are topics with enormous potential for study. All of these applications would contribute greatly to the independence and well-being of the elderly, which in turn would ease the economic and social burden of aging worldwide.

Conclusion

There was a correlation between cell phone use and some demographic and lifestyle variables, namely sex, education level, and tobacco use. These results also highlight the need to be educated in the use of modern technologies, as negative and unhealthy behaviors can easily emerge if adequate training and cultural reinforcement are not offered to the different target groups.

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Conflicts of interest

There are no conflicts of interest.

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