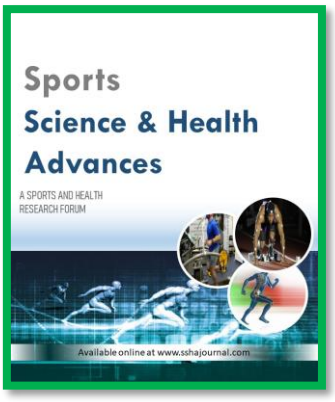
Original Article

Utilizing Mobile Technology Devices to Enhance Health and Quality of Life for Senior Citizens in Bangkok

Chusak Narkprasit

PhD. eLearning, Graduate School of Advanced Technology Management, Assumption University, Thailand

***Correspondence**: chusak.na@gmail.com



Peer-Reviewed
Refereed
Indexed

How to cite: Narkprasit, C. (2024). Utilizing Mobile Technology Devices to Enhance Health and Quality of Life for Senior Citizens in Bangkok. *Sports Science & Health Advances*. 2(2), 299-304. https://doi.org/10.60081/SSHA.2.2.2024.299-304

Received: 14-11-2024
Accepted: 02-12-2024
Published: 30-12-2024

Abstract

Purpose: This research aimed to utilize mobile technology devices to enhance health and quality of life for senior citizens in a district of Bangkok. The new sport watch and mobile health devices can monitor and record all-day activity of their exercise, i.e. time, distance, speed, step, position (via GPS), heart rate, breath, blood pressure etc. **Methodology**: The questionnaires were designed to collect data on their health records, physical activity, and mobile health devices skill and quality of life. The target population was the seniors aged 50 up who regularly exercised at the public parks in Bangkok. **Findings**: The research revealed that the participants had a moderate to a high level of skill in using mobile health devices. The top types of exercises they preferred were walking, running, aerobic & dancing, bicycle, and other sports at 54, 19, 16, 9 and 3 % receptively. Half (50%) of the participants suffered from the chronic diseases. They had 24 % with non-communicable diseases (NCD); Heart diseases & Strokes, Diabetes, High Blood Pressure and Cancer. Moreover, they were also found 11.43 % afflicted with Allergy and 18.57 % with Bone-related sickness and 15.71 % with other symptoms. **Research Implications**: With the utilization of advanced mobile technology, they revealed a high level of Quality of Life especially in Physical health, Mental health, Social and Living environment. **Practical Implications**: The overall average score was at a high level i.e. the seniors in the Bangkok district had a high level of quality of life by utilizing advanced mobile technology or mHealth to monitor and enhance their health through regular exercises.

Keywords: Mobile Technology, Sport Watch, Wearable Health Devices, Quality of Life, mHealth

Introduction

Thailand has become a completed ageing society with a population aged 60 and over of 13.2 million in 2024, or 20 % of the total population since 2023 (NESDC, 2024). Healthcare service for the elderly is a great concern for the years to come. The World Health Organization (2024) reported that noncommunicable diseases (NCDs) kill 41 million people each year, equivalent to 74% of all deaths globally. In the last decade, non-communicable diseases consisted of heart disease, stroke, diabetes, high blood pressure, and cancer became the number one cause of death in the world. During COVID-19 pandemic, the seniors became the high-risk group for COVID-19 as the number of deaths in this group was the highest especially those who had chronic non-communicable diseases (NCD). Exercise and physical

activity were suggested as therapy to fight against the mental and physical consequences of COVID-19 quarantine in older people (WHO, 2021). Narkprasit (2021) reported positive exercise outcomes on health and disease of senior citizens in a Bangkok district during COVID-19 pandemic connecting through social networks.

The rapid development of new technology of mobile health (mHealth) systems is making a huge impact on healthcare fields. Emerging new era of mobile health technologies creates a new opportunity in healthcare professionals (Park, 2016). mHealth has been defined as "mobile computing, medical sensor, and communication technologies for healthcare. Wallask (2017) mobile technology in healthcare looks toward a brighter future. Mobile medical and health apps, state of the art, concerns regulatory control and certification (Vaghifi et. al., 2014). mHealth or mobile health is a term used for the practice of medicine and public health supported by mobile devices (Kumar, 2013; Murfin, 2013). Free et. al. (2017) studied the effectiveness of mobile-health technology-based health behaviour change or disease management interventions for health care consumers. A study suggested incorporating mobile technology into psychosocial and health behavior treatments.

Wearable technology is becoming an integral part of the solution for providing health care to a growing world population that will be strained by a ballooning aging population (Nelson et al., 2019). Iqbal al. (2021) indicated advancement in healthcare wearable devices. Wearable computing has the potential to encourage physical activity by increasing health awareness and persuading change through just-in-time feedback. Many studies were conducted concerning application of mobile technology and mobile health apps to promote healthcare (Steinhubl et al., 2015). Kurbis et al. (2017) found that older adults and mobile technology enhance behavior in the context of behavioral health. Social participation and healthy aging were studied for significant protective factor for chronic non communicable conditions.

Quality of life was also related to physical activities of daily living among elderly (Yamwong, 2014). Bahramnezhad et. al. (2017) conducted research study and found that there was positive and significant relationship between social networks and quality of life in the elderly. An internationally applicable instrument to access quality of life in the elderly was suggested. Huang (2013) conducted research on innovative health care delivery systems through telecare. Telehealth can also help promote health awareness, healthcare delivery and improve quality of life for those, particularly senior citizens to improve their well-being with a lower cost of healthcare and self-control. The World Health Organization defied Telehealth as the use of telecommunications and virtual technology to deliver health care outside of traditional health care facilities. Telehealth in primary healthcare was applied for Diabetes self-management (So & Chung, 2017).

The rapid advancement of mobile phone technology and mobile health devices create an opportunity for healthcare for seniors, chronic disease patients or athlete. The new invention sport watch, smart watch and mobile health devices can monitor all-day activity and record the level of their exercise, i.e. time, distance, speed, step, position (via GPS), heart rate, breath, blood pressure, calories, and sleep pattern. The data will be monitored during their exercises or all-day activity analyzed and transmitted through the application installed on the smartphone to share with their trainers, doctors, family, and friends. As Thailand is in the transition to 5G together with the new development of sport watch, mobile health devices and the Apps, healthcare and quality of life enhancement can be driven for the senior citizens.

Methodology

The objectives of this research were as follows:

1. To explore the utilization of mobile technology devices consisting of smartphone, sport watch, and mobile health devices to monitor and enhance health for senior citizens in Bangkok district.
2. To evaluate Quality of Life of the participants.

This research was designed to find the effectiveness of applying mobile technology to enhance health and QOL for senior citizens in Bangkok. The target population consisted of senior citizens who regularly exercised at the public parks in Thawiwatthana district of Bangkok. The sample was purposely selected and invited to participate in the research. A total of 70 participants aged 50 up voluntarily registered to join the activity and respond to an online questionnaire.

The research instruments comprised a set of questionnaires designed to collect data in 5 categories as follows.

- Demographic data of senior citizens
- Health & sickness records
- Exercise & Physical activity
- Smartphone and Mobile health usage and skill
- Quality of Life (adapted from WHOQOL-BREF-THAI questionnaire, Department of Mental Health, 2019)

Data collection was conducted through an online questionnaire. Descriptive statistics was applied to analyze the data. This research has been approved by Assumption University and conducted with the participants who voluntarily participated. Their responses have been kept confidential for the research only.

Results

The research results are summarized as follows.

The questionnaire was tested for reliability with a similar group of 30 seniors. The Cronbach's Alpha was .95. The result results showed that the participants consisted of seniors aged 50 up, with an average age of 61. The participants consisted of 37 % males and 63 % females. About half of them, 51-55% were retired government officials, and 29-33 % were private company employees and 10-13% were business owners. The participants, 32-33% had a bachelor's degree and 62-68% possessed higher degrees. Most of them, 54-74% still lived with their family. The participants were using LINE (95%), Facebook (45%) and email (5%). Most of them spent time connecting social media 2-5 hours per day.

Table 1: Health and Sickness Record of senior citizens.

Items	Number of Participants	Participants (%)
Participants	70	100
Male	26	37.14
Female	44	62.86
Health Record		
No disease	35	50.00
Heart disease & Strokes	2	4.29
Diabetes	5	7.14
High blood pressure	6	8.57
Cancer	3	4.29
Allergy	8	11.43
Bone	13	18.57
Other	11	15.71

Table 1 shows that half (50%) of the participants suffered from the diseases. They had 24 % with non-communicable diseases (NCD) i.e., heart diseases & Strokes, Diabetes, High Blood Pressure and Cancer. They also found 11.43 % afflicted with Allergy and 18.57 % with Bone-related sickness and 15.71 % with other symptoms.

Table 2 indicates that 54.29, 18.57, 15 71, 8.57 and 2.86 % of the participants preferred walking, running, aerobics & dancing, Bicycle and Other Sports, respectively. Their major reasons to exercise were for good health (87-90%) followed by stress release, social and sickness recovery.

Table 2 Preferred Physical Activity

Activity Exercise and Sports	Number of Participants	%
Walking	38	54.29
Running	13	18.57
Aerobics and Dancing	11	15.71
Bicycle	6	8.57
Other Sports	2	2.86

Table 3: Mobile health devices skill and attitude

Item	Average Score	Level
Satisfaction	3.66	High
Technology skill	2.96	Moderate
Advantage	3.38	Moderate
Future trend awareness	3.35	Moderate
Overall Avg. Score	3.34	Moderate

Table 4: Evaluation of the Quality of Life of the participants.

No. Item	Average Score	Level
1 Physical health	3.58	High
2 Mental health	3.57	High
3 Social	3.65	High
4 Living Environment	3.56	High
5 Sex satisfaction	3.42	Mod.
Avg. Score	3.56	High

Table 3 All of them were using smartphone. About half could use sport watch and mobile heart rate & blood pressure devices to monitor and enhance their exercise and health regularly. The results showed a high level of satisfaction on mobile technology devices and moderate level on Technology skill, Advantage and Future trend. The overall average score was at moderate level.

Table 4 The results showed a high level in Physical health, Mental health, Social, Living environment and a moderate level in Sex satisfaction. The top three items were for social, physical and Metal health respectively. The overall average score was at a high level.

Discussion

The research results revealed that the application of advanced mobile technology could help enhance healthcare and quality of life for senior citizens. The research results also complied with the research studies that the social network among the elderly had a positive relationship with the quality of life (Bahramnezhad, 2017) and improvement in quality of life was found by physical activities of daily living among elderly patients (Yamwong, 2014). The research study complied with Free et al. (2013) which indicated the effectiveness of mobile-health technology in enhancing health behavior change in healthcare. It was also suggested that the older adults and mobile technology could enhance behavior in the context of health (Kurbis, 2017).

The research revealed that applications of mobile technology incorporating smartphone, social networks, sport watch and wearable health devices can help senior citizens monitor their health and improve their quality of life through the use of advanced technology. The emerging new era of mobile health technologies creates a new opportunity in healthcare professionals. Wallask (2017) mobile technology in healthcare looks toward a brighter future. It is suggested for further research study to monitor the participants for a longer

period, 6-12 months and check their health and quality of life in the long run. Furthermore, the population should be expanded to cover bigger target groups.

The application of mobile technology will also reduce the cost of healthcare for seniors and provide timely treatment and rehabilitation for chronic disease patients or low-income earners through online communication with doctors without several visits to the healthcare service facility.

Conclusion

The research was conducted with the senior citizens aged 50 - 80 years old who regularly exercise at the public parks in a district of Bangkok. They were invited to participate in the research survey and answer the online questionnaire via social networks. The participants were using smartphone and social networks. They also had a moderate to high level of skill in using sport watch, mobile health devices. The research showed that they preferred top 5 exercises: Walking, Running, Aerobic & Dancing, Bicycle and Other sports at 54, 19, 16, 9 and 3 % receptively. Half (50%) of the participants suffered from chronic diseases. They had 24 % with non-communicable diseases (NCD); Heart diseases & Strokes, Diabetes, High Blood Pressure and Cancer. They also found 11.43 % afflicted with Allergy and 18.57 % with Bone-related sickness and 15.71 % with other symptoms. With utilization of advance mobile technology devices, they revealed a high level of Quality of Life especially in Physical health, Mental health, Social, Living environment and moderate level in Sex satisfaction. The overall average score was at a high level. Overall, the seniors in a district of Bangkok had a high level of quality of life by applying advanced mobile technology to enhance their health and wellbeing.

The research results revealed that the application of advance mobile technology could help enhance healthcare and quality of life for senior citizens. The results also complied with the research studies that the social network among the elderly had a positive relationship with the quality of life. The research study also indicated the effectiveness of mobile-health technology in enhancing health for the seniors.

References

Anderson, K., Burford, O., & Emmerton, L. (2016). Mobile Health Apps to Facilitate Self-Care: A Qualitative Study of User Experiences. PLOS ONE, May 2016; 11(5): e0156164. https://doi.org/10.1371/journal.pone.0156164

Bahramnezhad, F., Chalik, R., Bastani, F., Taherpour, M., & Navab, E. (2017). The social network among the elderly and its relationship with quality of life. Electronic physician, 2017; 9(5): 4306–4311. doi:10.19082/4306.

Boulos, M. N., Brewer, A. C., Karimkhani, C., Buller, D. B., & Dellavalle, R. P. (2014). Mobile medical and health apps: state of the art, concerns, regulatory control and certification. Online journal of public health informatics; 5(3): 229. doi:10.5210/ojphi.v5i3.4814

Department of Mental Health. (2019). WHOQOL-BREF-THAI Questionnaire. Ministry of Public Health: https://www.dmh.go.th/test/whoqol/ (in Thai).

Free, C., Phillips, G., Galli, L., Watson, L., Felix, L., Edwards, P., et al. (2013). The Effectiveness of Mobile-Health Technology-Based Health Behaviour Change or Disease Management Interventions for Health Care Consumers: A Systematic Review. PLOS Medicine, January 2013;10(1): e1001362. https://doi.org/10.1371/journal.pmed.1001362

Huang, J. C. (2013). Innovative Health Care Delivery System- a Questionnaire Survey to Evaluate the Influence of Behavioral Factors on Individuals' Acceptance of Telecare, Computing Biology Medicine, May 2013; 43(4): 281-6.

Iqbal, S. M., Mahgoub, I., Du, E., Leavitt, M. A., & Asghar, W. (2021). Advances in healthcare wearable devices. NPJ Flexible Electronics, 5(1), 9. https://scholar.google.co.th/scholar?q=Advances+in+healthcare+wearable+devices&hl=th&as_sdt=0&as_vis=1&oi=scholart

Kelli, H.M., Witbrodt, B., Shah, A. (2017). The Future of mobile health applications and devices in cardiovascular health. Euro Med J Innov. 2017 Jan;2017:92-97. Epub 2017 Jan 10. PMID: 28191545; PMCID: PMC5298843.

Kuerbis, A., Mulliken, A., Muench, F., Moore, A. A., & Gardner, D. (2017). Older adults and mobile technology: Factors that Enhance and Inhibit

Utilization in the Context of Behavioral Health. Mental Health and Addiction Research. April 2017; 2(2): 1-11, doi: 10.15761/MHAR.1000136

Kumar, S. (2013). Mobile Health Technology Evaluation: The mHealth Evidence Workshop. American Journal of Preventive Medicine, August 2013; 45 (2): 228-236.

Li, J., Ma, Q., Chan, A.H., Man, S. (2019). Health monitoring through wearable technologies for older adults: Smart wearables acceptance model. Appl. Ergon; 75:162–169. doi: 10.1016/j.apergo.2018.10.006.

Murfin, M. (2013). Know your apps: an evidence-based approach to the evaluation of mobile clinical applications. J Physician Assist Educ; 24(3): 38–40.

Narkprasit, C. (2021). Active exercise outcome on health and disease of senior citizens in a Bangkok district during COVID-19 pandemic. Journal of Public Health and Development, 19(3), 119–129. https://he01.tci-thaijo.org/index.php/AIHD-MU/article/view/251874

National Economic and Social Development Council. (2024). Report on Thailand aging population. The Nation. April 13, 2024.

Nelson, E.C., Verhagen, T., Vollenbroek-Hutten, M., Noordzij, M.L. (2019). Is Wearable Technology Becoming Part of Us? Developing and Validating a Measurement Scale for Wearable Technology Embodiment. JMIR Mhealth Uhealth. 2019 Aug 9;7(8):e12771. doi: 10.2196/12771. PMID: 31400106; PMCID: PMC6709898.

Park, Y. T. (2016). Emerging New Era of Mobile Health Technologies. Healthcare informatics research; 22(4): 253–254. doi:10.4258/hir.2016.22.4.253

So, C.F., and Chung, W. Y. (2017). Telehealth for Diabetes Self-management in Primary Healthcare: A Systematic Review and Meta-Analysis. Journal of Telemedicine and Telecare, 2017 May 2.

Steinhubl, S. R., Muse, E. D, and Topol, E. J. (2015). The emerging field of mobile health. Sci. Transl. Med.7,283rv3-283rv3. DOI:10.1126/scitranslmed.aaa3487

Vaghefi, I., & Tulu, B. (2019). The Continued Use of Mobile Health Apps: Insights From a Longitudinal Study. JMIR mHealth and uHealth; 7(8): e12983. doi:10.2196/12983

Ventola, C. L. (2014). Mobile devices and apps for health care professionals: uses and benefits. P & T: a peer-reviewed journal for formulary management; 39(5): 356–364.

Wallask, S. (2017). Mobile technology in healthcare looks toward a brighter future. 2017. https://searchhealthit.techtarget.com/opinion/Mobile-technology-in-healthcare-looks...

Wang, J. B., et al. (2015). Wearable Sensor/ Device (Fitbit One) and SMS Text-Messaging Prompts to Increase Physical Activity in Overweight and Obese Adults: A Randomized Controlled Trial. Telemed J E Health. 2015;21(10):782–92. doi: 10.1089/tmj.2014.0176

Wikipedia. (2019). mHealth. https://en.wikipedia.org/wiki/MHealth

World Health Organization. (2024). Noncommunicable diseases https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases

Yamwong, N. (2014). Quality of Life and Physical Activities of Daily Living Among Elderly Patients at HRH Princess Maha Chakri Sirindhorn Medical Center. Journal of Medicine and Health Sciences, April 2014; 21 (1): 37-44.