Journal of Information Systems Engineering and Management
2025, 10(54s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Effectiveness of Wearable Devices on Quality of Life: A Pilot Study

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ARTICLE INFO

Received: 30 Dec 2024

Revised: 05 Feb 2025

Accepted: 25 Feb 2025

ABSTRACT

Introduction: Wearable devices have become increasingly popular for monitoring fitness, health, and overall well-being. Despite their widespread use, the effectiveness of these devices in enhancing various quality of life domains remains under-explored, particularly in terms of their impact on psychological health, physical health, social relationships, and environmental quality of life.

Objectives: Lacinia at quis risus sed vulputate odio ut enim. Orci porta non pulvinar neque laoreet suspendisse interdum. Consequat mauris nunc congue nisi vitae suscipit. Morbi quis commodo odio aenean.

Purpose: This study aims to evaluate the effectiveness of wearable devices in improving multiple aspects of quality of life. The study assesses the correlation between overall positive experiences with wearable devices and various quality of life domains.

Methods: A pilot study was conducted with 79 participants using a cross-sectional survey design. Participants were assessed on their main motivations for using wearable devices, overall experience, and perceived benefits related to quality of life.

Results: The findings indicate that wearable devices are primarily used for improving fitness, with a general positive experience reported by most participants. Significant positive correlations were observed between overall positive wearable experience and improvements in psychological health ($r = 0.349$, $p = 0.010$), physical health ($r = 0.338$, $p = 0.012$), social relationships ($r = 0.325$, $p = 0.016$), and environmental quality of life ($r = 0.413$, $p = 0.002$).

Conclusions: The study supports the effectiveness of wearable devices in enhancing quality of life, with particular benefits observed in psychological health, physical health, social relationships, and environmental quality of life. The findings suggest that wearable devices can contribute positively to users' overall well-being, although the impact varies across different quality of life domains.

Keywords: Wearable Devices, Quality of Life, Psychological Health, Physical Health, Social Relationships, Environmental Quality

INTRODUCTION

Wearable devices have become increasingly prevalent in modern life, offering users a variety of functionalities to monitor and improve their health and well-being. These devices, ranging from fitness trackers to smartwatches, are designed to track physical activity, health metrics, and even sleep patterns. Despite their growing popularity, the impact of wearable devices on users' overall quality of life remains an area of considerable interest and investigation. The effectiveness of these devices in enhancing various aspects of life, including psychological health, physical health, social relationships, and environmental quality, is not yet fully understood (Candeia et al., 2024; Larnyo et al., 2022).

The integration of wearable technology into daily routines presents both opportunities and challenges. On the one hand, these devices can provide valuable insights and data that may encourage healthier lifestyles and better management of personal health. For instance, real-time feedback on physical activity can motivate users to increase their exercise levels, while health monitoring features can help in early detection and management of medical

conditions. On the other hand, the actual impact of these devices on different domains of quality of life is complex and multifaceted, encompassing psychological, social, and environmental dimensions (Fazal-e-Amin, 2018; Lind et al., 2023; Seçkin et al., 2023).

Understanding how wearable devices influence these areas is crucial for evaluating their overall effectiveness. Psychological health, for example, may benefit from increased physical activity and self-monitoring, potentially leading to improved mood and reduced stress levels (Choudhury & Asan, 2021; Egger et al., 2020; Lind et al., 2023) . Physical health is directly addressed through features that encourage exercise and track health metrics (Almuwais & Alharbi, 2022; Yeh et al., 2022). Social relationships may be affected by the degree to which users share their health data with others or engage in community-based activities facilitated by these devices (Bochimoto et al., 2023). Environmental quality of life might be influenced by the ways in which these devices integrate into users' daily routines and their overall convenience and usability (Lee et al., 2022).

However, the benefits of wearable devices are not uniformly experienced. Variations in user experience, motivation, and personal circumstances can influence the effectiveness of these devices (Michaelis et al., 2016). Some users may find significant improvements in their quality of life, while others may experience minimal or no benefit. Moreover, the potential for wearable devices to address specific needs and preferences remains an area requiring further exploration (Asimakopoulos et al., 2017).

OBJECTIVES

The present study aims to assess the impact of wearable devices on various quality of life domains by evaluating users' motivations, experiences, and perceived benefits among adults in India. By analyzing correlations between overall positive experiences with wearable devices and improvements in psychological health, physical health, social relationships, and environmental quality of life, this study seeks to provide a comprehensive understanding of how these technologies affect users' lives. This research is crucial for optimizing wearable device features and functionalities to better support users in achieving their health and well-being goals. While wearable devices hold promise for enhancing quality of life, it is essential to systematically evaluate their impact across different domains. This study addresses this need by investigating the relationships between wearable device use and various aspects of quality of life, with the goal of providing insights that can guide future developments in wearable technology.

METHODS

Participants: The study included 79 participants who were users of wearable devices, residing in various urban and suburban areas. Participants were selected using a random sampling method to ensure a representative sample of wearable device users. The sample consisted of individuals who were at least 18 years old and had been using a wearable device for a minimum of three months to ensure familiarity with the device's functionalities (Table 1).

Research Design: A cross-sectional survey design was employed to assess the participants' experiences with wearable devices and their impact on various quality of life domains. Participants completed a structured questionnaire designed to capture their motivations for using wearable devices, overall experience, and perceived benefits related to physical health, psychological health, social relationships, and environmental quality of life. The survey also included measures of the participants' overall positive experience with the wearable device and its perceived usefulness.

Inclusion Criteria: Participants were included if they were current users of wearable devices and had used the device for at least three months. Inclusion criteria required that participants be over 18 years of age and provide informed consent to participate in the study. The sample was intended to capture a broad range of experiences with wearable devices to assess their impact across different domains of quality of life.

Exclusion Criteria: Individuals who had used a wearable device for less than three months or those who had only recently started using the device were excluded from the study. Additionally, participants who did not use the device regularly or who did not complete the survey in full were excluded. Individuals with cognitive impairments or those unable to provide informed consent were also excluded to ensure the reliability and validity of the responses.

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Procedure: Participants were invited to complete an online survey that included questions about their motivations for using wearable devices, their overall experience, and the perceived impact of the devices on their quality of life. The survey was administered using a secure online platform, and responses were collected over a four-week period. Descriptive and inferential statistical analyses were conducted using SPSS software to examine the relationships between wearable device use and quality of life domains. Prior to enrollment in the study, participants were provided with a thorough explanation of the research objectives and procedures. Informed consent was obtained from all participants, ensuring they understood the study and the confidentiality of their data. Participants were informed that their data would be used exclusively for scientific research purposes.

A total of 79 participants who use wearable activity trackers were included in this study. They were randomly assigned to complete an online survey assessing their experiences with wearable devices and their perceived quality of life. The study was conducted over a four-week period. Participants completed two primary questionnaires: "Users' Experience of Wearable Activity Trackers" (Maher et al., 2017) and "Quality of Life Scale" (WHOQOL-BREF, 2012).

Participants were screened to ensure they met the study criteria and provided informed consent. They were given detailed information about the study's aims and the expected time commitment for completing the survey. Participants received a link to the online survey via email. The survey included both the Users' Experience of Wearable Activity Trackers and the WHO Quality of Life Scale. A reminder email was sent midway through the data collection period to encourage participation and ensure a higher response rate. Participants completed the online survey, which measured their experiences with wearable devices and their quality of life. The survey data were collected anonymously to maintain confidentiality. The collected data were analyzed using descriptive and inferential statistical methods. Descriptive statistics summarized participants' responses, while inferential statistics examined the relationships between wearable device usage and quality of life dimensions. Participants were also asked for feedback on the survey's clarity and overall experience to improve future research efforts.

The goal of this procedure was to evaluate the impact of wearable devices on users' quality of life and their overall satisfaction with these devices. The study aimed to provide insights into how wearable devices affect physical health, psychological well-being, social interactions, and environmental quality of life.

Measures

Users' Experience of Wearable Activity Trackers (Maher et al., 2017)

The questionnaire consists of 45 items evaluating various aspects of users' experiences with wearable activity trackers. Reliability is reported with Cronbach's alpha ranging from 0.60 to 0.81. Higher scores reflect more positive user experiences with the wearable devices.

Quality of Life Scale (WHOQOL-BREF, 2012)

This scale includes 26 items that measure four domains of quality of life: physical health, psychological health, social relationships, and environmental quality. Reliability ranges from Cronbach's alpha 0.66 to 0.84. Higher scores indicate better quality of life across these domains.

Statistical Analysis

Statistical analyses were performed using IBM SPSS 26.0. Descriptive statistics were used to summarize the data, and inferential statistics, including correlation analyses, were conducted to explore relationships between wearable device usage and quality of life measures.

RESULTS

Table 1 Demographic details of the participants

Variables	n = 79	Percentage %
Gender		

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Male	75	95%
Female	4	5%
Age		
25 – 30	5	6%
31 – 40	47	59%
41– 50	27	34%
Education Qualification		
Bachelors	26	33%
Masters	53	67%
Marital Status		
Single	5	3%
Married	72	91%
Committed	2	6%

Table 1 presents the demographic details of the study sample comprising 79 participants. The gender distribution shows a dominant male representation at 95% (n = 75), with females constituting only 5% (n = 4). The age distribution is skewed towards the 31–40 years age group, which represents 59% (n = 47) of the sample. Participants aged 41–50 years make up 34% (n = 27), while the 25–30 years age group accounts for 6% (n = 5). In terms of educational qualifications, 67% (n = 53) of the respondents hold a Master's degree, whereas 33% (n = 26) have a Bachelor's degree. The marital status distribution indicates that 91% (n = 72) of the participants are married, 6% (n = 2) are committed, and 3% (n = 5) are single. This demographic profile underscores a predominantly male, middle-aged, and highly educated respondent group with a majority being married.

Table 2 Motivations, Experiences, and Perceived Benefits of Wearable Devices

Questions	Count	% of Total
Frequencies of Main Motivation for Using Wearable		
To improve fitness	4	16.7%
To improve fitness; To improve health	1	4.2%
To improve fitness; To improve health; To improve appearance	2	8.3%
To monitor activities; To keep up with new technology	1	4.2%
To compete with family/friends	1	4.2%
Not using	1	4.2%
Using phone	1	4.2%
Frequencies of Agreement on Eating Healthier Since Using Wearable		
Disagree strongly	3	12.5%
Somewhat disagree	3	12.5%
Neutral	9	37.5%
Somewhat agree	4	16.7%
Agree strongly	5	20.8%
Frequencies of Agreement on Incorporating More Activity Since Using Wearable		
Disagree strongly	4	16.7%
Somewhat disagree	1	4.2%
Neutral	6	25.0%
Somewhat agree	7	29.2%

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Agree strongly	6	25.0%
Frequencies of Agreement on Sleeping More Since Using Wearable		
Disagree strongly	2	8.3%
Somewhat disagree	5	20.8%
Neutral	8	33.3%
Somewhat agree	3	12.5%
Agree strongly	6	25.0%
Frequencies of Agreement on Real-Time Monitoring Usefulness		
Disagree strongly	3	12.5%
Somewhat disagree	4	16.7%
Neutral	11	45.8%
Somewhat agree	6	25.0%
Frequencies of Agreement on Long-Term Monitoring Usefulness		
Disagree strongly	5	20.8%
Somewhat disagree	2	8.3%
Neutral	10	41.7%
Somewhat agree	6	25.0%
Agree strongly	1	4.2%

Table 2 outlines the motivations, experiences, and perceived benefits of wearable devices among respondents. The main motivation for using wearables primarily centers on improving fitness, reported by 16.7% of participants. Additional motivations include improving both fitness and health (4.2%), or a combination of fitness, health, and appearance (8.3%). Other reasons for usage include monitoring activities and staying updated with new technology (4.2%), competing with family or friends (4.2%), or preferring not to use the device or using a phone instead (4.2%).

Regarding the impact on lifestyle changes, the majority of respondents reported neutral feelings about whether they have eaten healthier since using a wearable, with 37.5% remaining neutral. In contrast, 20.8% strongly agreed and 16.7% somewhat agreed that their eating habits have improved. Conversely, 25% of participants either somewhat disagreed or strongly disagreed with this statement.

When assessing the impact on physical activity, 29.2% of respondents somewhat agreed that they have incorporated more activity since using their device, and 25% strongly agreed. However, 16.7% strongly disagreed, and 4.2% somewhat disagreed, with 25% remaining neutral.

For sleep improvements, 33.3% of participants were neutral about whether they sleep more since using the wearable device. Meanwhile, 25% strongly agreed and 12.5% somewhat agreed with the statement, whereas 20.8% somewhat disagreed, and 8.3% strongly disagreed.

In terms of the usefulness of real-time monitoring, 45.8% of respondents felt neutral about its effectiveness, while 25% somewhat agreed. A smaller proportion, 12.5%, strongly disagreed, and 16.7% somewhat disagreed. For long-term monitoring, 41.7% of participants were neutral, 25% somewhat agreed, and 20.8% strongly disagreed. Only 4.2% strongly agreed with the usefulness of long-term monitoring, and 8.3% somewhat disagreed.

This data provides a comprehensive view of the varied experiences and perceived benefits associated with wearable devices, highlighting a range of motivations and mixed responses regarding their impact on lifestyle changes and monitoring functionalities.

Table 3 Wearable experience

Overall positive experience	Counts	% of Total
Somewhat disagree	1	2 %
Neutral	7	13 %
Somewhat Agree	26	47 %
Agree Strongly	21	38 %

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Table 3 presents the respondents' overall experience with wearable devices. The majority of participants report a positive experience, with 47.3% indicating that they somewhat agree that their experience has been positive, and 38.2% strongly agreeing with this sentiment. A smaller proportion, 12.7%, remained neutral regarding their experience with the device. Only 1.8% of respondents somewhat disagreed with the statement, reflecting a very small minority who did not view their experience as positive (Fig.1.2).

This distribution highlights a generally favorable perception of wearable devices among the majority of users, with a significant percentage expressing strong agreement about the positive nature of their experience.

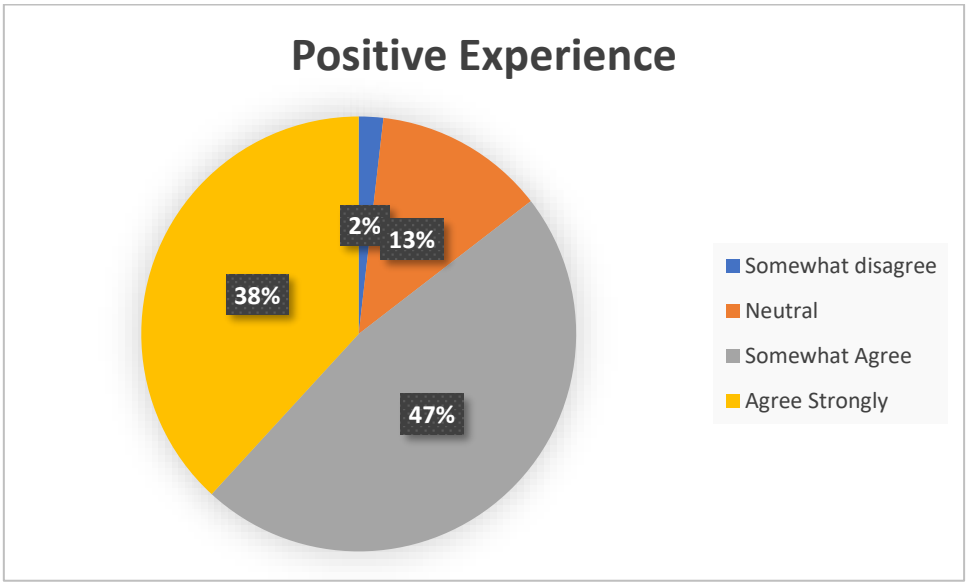

Figure. 1.2. Positive wearable experience

Table 4 Descriptive Statistics for Quality of Life Domains

Statistic	Physical Health	Psychological Health	Social Relationships	Environmental Quality of Life
Mean	23.9	20.8	11.9	30.1
Standard Deviation	4.25	3.78	2.53	5.66

Table 4 provides the descriptive statistics for various quality of life domains among the 79 respondents. The average score for **Physical Health** is 23.9, with a standard deviation of 4.25, indicating variability in the physical health scores across the sample. **Psychological Health** has a mean score of 20.8 and a standard deviation of 3.78, reflecting a moderate range of psychological well-being among participants. For **Social Relationships**, the mean score is 11.9, with a standard deviation of 2.53, suggesting less variability in social relationship quality compared to other domains. Finally, the **Environmental Quality of Life** domain has the highest mean score at 30.1, with a standard deviation of 5.66, indicating a broader range of perceptions about environmental quality among the respondents.

These results provide an information of the respondents' perceived quality of life across different domains, with environmental quality showing the highest average score and social relationships the lowest.

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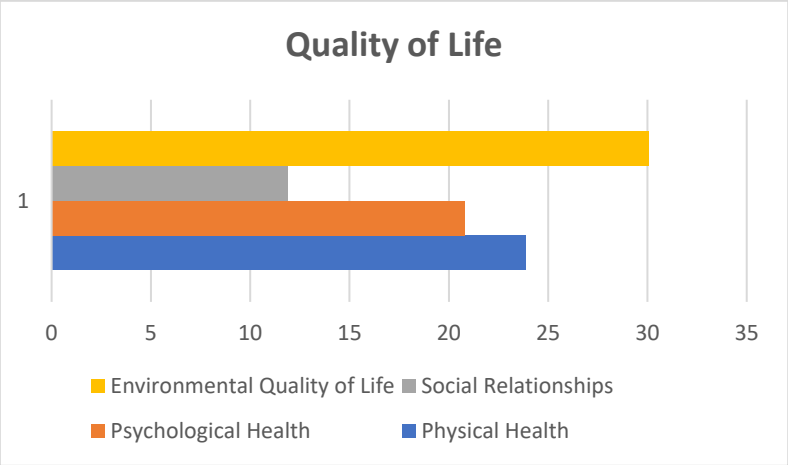

Figure. 1.3. Quality of Life

Table 5 Correlation between positive wearable experience and quality of life.

Variables		Psychological health	Physical health	Social relationships	Environmental	Overall positive wearable experience
Psychological health	Pearson's r	—				
	p-value	—				
Physical health	Pearson's r	0.724 ***	—			
	p-value	< .001	—			
Social relationships	Pearson's r	0.665***	0.643***	—		
	p-value	< .001	< .001	—		
Environmental	Pearson's r	0.824***	0.686***	0.742***	—	
	p-value	< .001	< .001	< .001	—	
Overall positive wearable experience	Pearson's r	0.349**	0.338*	0.325*	0.413**	—
	p-value	0.010	0.012	0.016	0.002	—

Note. * p < .05, ** p < .01, *** p < .001

Table 5 displays the correlation matrix for various quality of life domains and overall positive wearable experience. The correlations between the quality of life domains are all statistically significant. Psychological Health is strongly positively correlated with Physical Health (Pearson's r = 0.724, p < .001), Social Relationships (Pearson's r = 0.665, p < .001), and Environmental Quality of Life (Pearson's r = 0.824, p < .001). These high correlations suggest that improvements in one domain are associated with improvements in the others.

Physical Health also shows strong positive correlations with Social Relationships (Pearson's r = 0.643, p < .001) and Environmental Quality of Life (Pearson's r = 0.686, p < .001), indicating that better physical health is linked to better social and environmental quality of life.

Social Relationships and Environmental Quality of Life are positively correlated (Pearson's r = 0.742, p < .001), demonstrating that improvements in social relationships are associated with better environmental quality.

The correlations between the overall positive wearable experience and the quality of life domains are also significant, albeit weaker. The overall positive wearable experience is positively correlated with Psychological Health (Pearson's r = 0.349, p = 0.010), Physical Health (Pearson's r = 0.338, p = 0.012), Social Relationships (Pearson's r = 0.325, p = 0.016), and Environmental Quality of Life (Pearson's r = 0.413, p = 0.002). These findings suggest that a more

positive experience with wearable devices is modestly associated with better psychological health, physical health, social relationships, and environmental quality of life.

Overall, the data indicates significant interrelationships between the quality of life domains and highlights a moderate association between a positive wearable experience and various aspects of quality of life.

DISCUSSION

This study provides insights into the demographic characteristics, motivations, experiences, and perceived benefits of wearable devices, as well as their relationship with various quality of life domains.

The sample is predominantly male (95%) and mostly aged between 31 and 50 years, with a high level of educational attainment and a majority being married. This demographic profile suggests a more mature, educated, and predominantly male user base for wearable devices. The high proportion of respondents with a Master's degree may indicate a higher propensity for adopting new technology among individuals with advanced education levels.

The primary motivation for using wearable devices is to improve fitness, with a smaller percentage also motivated by health, appearance, and technological interests. This aligns with the growing trend of using technology to enhance personal health and fitness. The overall positive experience reported by most respondents suggests that wearable devices are generally well-received, with nearly half of the participants somewhat agreeing and over a third strongly agreeing that their experience has been positive.

However, the relatively low percentages of participants who strongly disagreed or somewhat disagreed with their experience highlight that while the majority view the devices positively, there is still a small segment that does not share this sentiment.

The correlations between wearable device use and quality of life domains reveal important relationships. The significant positive correlations between Psychological Health, Physical Health, Social Relationships, and Environmental Quality of Life indicate that improvements in one domain are likely associated with improvements in others. This suggests that wearable devices, which are primarily used for health and fitness purposes, may have broader benefits for overall well-being.

The moderate correlations between overall positive wearable experience and quality of life domains suggest that while a positive experience with wearable devices is associated with better quality of life, the relationship is not overwhelmingly strong. Specifically, a positive wearable experience is modestly related to improvements in psychological health, physical health, social relationships, and environmental quality of life. This indicates that while wearable devices can contribute to a better quality of life, other factors are also likely influencing these outcomes.

These findings suggest that wearable devices can play a role in enhancing various aspects of quality of life, particularly through their impact on physical and psychological health. However, the moderate correlations highlight that while these devices contribute positively, they are not a panacea for improving all aspects of quality of life. Future research should explore how different features of wearable devices and user experiences contribute to these benefits and identify additional factors that may influence the relationship between wearable device use and quality of life.

While wearable devices are generally perceived positively and are associated with improvements in various quality of life domains, the strength of these associations is moderate. This underscores the need for continued exploration into how wearable technology can be optimized to enhance its impact on users' overall well-being.

REFRENCES

[1] Almuwais, N., & Alharbi, Z. H. (2022). The Effectiveness of Wearable Devices on the Users' Health: The Case of Saudi Arabia. SAR Journal - Science and Research.
[2] Asimakopoulos, S., Asimakopoulos, G., & Spillers, F. (2017). Motivation and User Engagement in Fitness Tracking: Heuristics for Mobile Healthcare Wearables. Informatics, 4, 5.

[3] Bochimoto, H., Ishimaru, T., Nakano, A., Hasegawa, K., Kimura, E., Tajima, S., Yoshikawa, T., & Nemoto, H. (2023). Association Between Workplace Social Support and Use of Health-Promoting Wearable Devices: A Prospective Cohort Study of Japanese Employees. Journal of UOEH, 45(2), 95–103. https://doi.org/10.7888/juoeh.45.95
[4] Candeia, V. C. U., Teixeira, T. A., Destefani, A. C., & Destefani, V. C. (2024). Portable And Continuous Monitoring Devices In Nephrology: Enhancing Clinical Outcomes And Patient Quality Of Life Through Real-Time Assessment And Personalized Treatment Approaches. Revista Ibero-Americana de Humanidades, Ciências e Educação.
[5] Choudhury, A., & Asan, O. (2021). Impact of using wearable devices on psychological Distress: Analysis of the health information national Trends survey. International Journal of Medical Informatics, 156, 104612.
[6] Egger, S. T., Knorr, M., Bobes, J., Bernstein, A., Seifritz, E., & Vetter, S. (2020). Real-Time Assessment of Stress and Stress Response Using Digital Phenotyping: A Study Protocol. Frontiers in Digital Health, 2, 544418. https://doi.org/10.3389/fdgth.2020.544418
[7] Fazal-e-Amin. (2018). Applications of Wearable Technology-Opportunities and Challenge.
[8] Larnyo, E., Dai, B., Larnyo, A., Nutakor, J. A., Ampon-Wireko, S., Nkrumah, E. N. K., & Appiah, R. (2022). Impact of Actual Use Behavior of Healthcare Wearable Devices on Quality of Life: A Cross-Sectional Survey of People with Dementia and Their Caregivers in Ghana. Healthcare (Basel, Switzerland), 10(2). https://doi.org/10.3390/healthcare10020275
[9] Lee, P., Kim, H., Kim, Y., Choi, W., Zitouni, M. S., Khandoker, A., Jelinek, H. F., Hadjileontiadis, L., Lee, U., & Jeong, Y. (2022). Beyond Pathogen Filtration: Possibility of Smart Masks as Wearable Devices for Personal and Group Health and Safety Management. JMIR MHealth and UHealth, 10(6), e38614. https://doi.org/10.2196/38614
[10] Lind, C. M., Abtahi, F., & Forsman, M. (2023). Wearable Motion Capture Devices for the Prevention of Work-Related Musculoskeletal Disorders in Ergonomics-An Overview of Current Applications, Challenges, and Future Opportunities. Sensors (Basel, Switzerland), 23(9). https://doi.org/10.3390/s23094259
[11] Maher, C., Ryan, J., Ambrosi, C., & Edney, S. (2017). Users' experiences of wearable activity trackers: A cross-sectional study. BMC Public Health, 17(1), 880. https://doi.org/10.1186/s12889-017-4888-1
[12] Michaelis, J. R., Rupp, M. A., Kozachuk, J., Ho, B., Zapata-Ocampo, D., McConnell, D. S., & Smither, J. A.-A. (2016). Describing the User Experience of Wearable Fitness Technology through Online Product Reviews. Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 60, 1073–1077.
[13] Seçkin, A. Ç., Ateş, B., & Seçkin, M. (2023). Review on Wearable Technology in Sports: Concepts, Challenges and Opportunities. Applied Sciences.
[14] World Health Organization. (2012). WHOQOL-BREF: Introduction, Administration, Scoring and Generic Version of the Assessment.
[15] Yeh, Y.-C., Yeh, A., Hung, S.-H., Wu, C.-C., Tung, Y.-H., Liu, S.-Y., Sullivan, W. C., & Chang, C.-Y (2022). An Application for Pairing with Wearable Devices to Monitor Personal Health Status. https://doi.org/10.3791/63169