Health Characteristics and Adherence Patterns in Electronic Wearable Device Users: A Study in Low- and Middle-Income Countries

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INTRODUCTION

The technological evolution has significantly shaped the interaction and monitoring of health and daily behaviors through electronic wearable devices (EWD), innovative devices designed to collect real-time data on various health-related variables. The integration of EWD into individuals' daily routines raises relevant questions about how these technologies can influence health-related behaviors.

OBJECTIVES

The present study aims to examine the health characteristics of individuals using electronic wearable devices (EWD) according to adherence to the use of the EWD.

METHODS

A prospective cohort study undertaken between December 2021 and May 2023. We selected individuals EWD users age 18 or older, using convenience sampling. At baseline, the participants completed enrollment self-reporting questionnaire to record demographic characteristics, physical activity, smoking, dietary, alcohol intake, sleep duration and chronic diseases. Using smartwatch data, we calculated average daily step counts, stair climbing, heart rate, blood pressure, sleep duration and oxygen saturation. Adherence to device usage was assessed based on the total days of automatic data collection. Participants were categorized into two groups based on the EWD utilization patterns (engaged: ≥120 days of use, non-engaged: <120 days of use).

RESULTS

Over the course of 18 months, we enrolled 3914 participants [median age 37 years (P25-P50: 30-45), 55% women], representing 39% of potentially eligible participants. 2006 (51.3%) were engaged and 1.908 (48.7%) non-engaged device users. Significant difference between groups was found for age group, cholesterol (p=0.02) and steps counts. A higher prevalence was observed in the 31-40 and 51-60 age groups for engaged group, while for the non-engaged group the prevalence was higher in the 20-30 age group (p=0.01). The median step count for non-engaged group was significant higher in the first 30 days (p=0.04) compared to engaged group. However, no significant difference was observed in the last 30 days (p=0.31). There was no significant difference between the groups for smoking (p=0.72), dietary (1.00), alcohol intake (0.77), sleep duration (0.26) and chronic diseases.

CONCLUSION

The results suggest no differences in long-term EWD use between groups. Older individuals are more engaged, and there may be an association with cholesterol comorbidity, indicating a higher need for physical activity in this group.

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Table 1. Baseline characteristics.

Characteristics	Engaged (n = 2.006, 51%)	Non-engaged (n = 1.908, 49%)	Valor *P*
Sex			
Female	1116 (55,6)	1075 (56,3)	0,611
Male	889 (44,3)	827 (43,3)	
Age (median)	38	37	< 0,001
Group			
< 20 years	7 (0,3)	17 (0,9)	
20 - 30 years	491 (24,5)	539 (28,2)	
31 - 40 years	714 (35,6)	645 (33,8)	
41 - 50 years	507 (25,3)	460 (24,1)	< 0,001
51 - 60 years	207 (10,3)	162 (8,5)	
61 - 70 years	63 (3,1)	72 (3,8)	
> 70 years	17 (0,8)	13 (0,7)	
Anxiety	724 (36,1)	721 (37,8)	0,286
Arthritis	1941 (96,8)	1856 (97,3)	0,394
Asthma	84 (4,2)	102 (5,3)	0,104
Stroke	9 (0,4)	5 (0,3)	0,478
Bronchitis	75 (3,7)	58 (3)	0,478
Cholesterol	314 (15,7)	250 (13,1)	0,026
Depression	234 (11,7)	232 (12,2)	0,669
Diabetes	126 (6,3)	112 (5,9)	0,638
Headache	148 (7,4)	132 (6,9)	0,620
Back Pain	191 (9,5)	201 (10,5)	0,316
Hypertension	299 (14,9)	280 (14,7)	0,875
Heart Attack	9 (0,4)	5 (0,3)	0,478
Renal Insufficiency	10 (0,5)	3 (0,2)	0,115
Obesity	406 (20,2)	346 (18,1)	0,103
Smoking	180 (9)	207 (10,8)	0,729
Physical Activity			
Never	841 (41,9)	814 (42,7)	
1 or 2 days	475 (23,7)	471 (24,7)	
3 or 4 days	392 (19,5)	337 (17,7)	0,602
5 or 6 days	179 (8,9)	165 (8,6)	
Every day	119 (5,9)	121 (6,3)	
Healthy Diet	834 (41,6)	845 (44,3)	1,000
Alcohol Intake			
Never	647 (32,3)	606 (31,8)	
Once a month or less	511 (25,5)	519 (27,2)	
2 - 3 times per week	260 (13)	246 (12,9)	0,774
2 - 4 times per week	526 (26,2)	484 (25,4)	
> 4 times per week	62 (3,1)	53 (2,8)	
Sleep Hours			
Up 5 hours	230 (11,5)	244 (12,8)	
Up 6 hours	577 (28,8)	525 (27,5)	
Up 7 hours	660 (32,9)	615 (32,2)	0,267
Up 8 hours	452 (22,5)	418 (21,9)	
> 8 hours	87 (4,3)	106 (5,6)	