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RESEARCH ARTICLE

SMART FITNESS: USAGE AND ATTITUDES TOWARDS WEARABLE FITNESS TRACKING DEVICES FOR IMPROVED PHYSICAL FITNESS AMONG HEALTH CARE PROFESSIONALS IN SOUTH INDIA

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ABSTRACT

Background: Wearable devices for tracking fitness are currently used among young adults such as health care professionals for their ease in self-monitoring of individual fitness goals. ***Objectives*****:** To determine the usage and attitudes towards wearable fitness tracking devices among health care professionals. ***Methodology*****:** A Google docs survey using a pre-tested questionnaire was designed and survey link was shared using social media networks. The respondent data was received in real-time and analyzed. ***Results*****:** Out of 588 respondents, 377(64.11%) were in ages 18-22 years, 296(50.3%) were males, 380 (64.6%) were medical undergraduates. Majority participants 493 (83.8%) heard about wearable fitness tracking devices and only 132(22.8%) ever used wearables. Among ever users of wearable devices, only 54(35.8%) were wearing devices to track fitness on a daily basis. Proportion of participants, using wearable fitness tracking device for a duration, between 2 months to 2 years were motivated more for being physically active than those using for a period of less than 2 months and more than 2 years respectively, and this difference was found to be statistically significant having a p value of <0.05. ***Conclusion*****:** The study reveals the minimal usage of wearable fitness devices among health care professionals on daily basis.

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INTRODUCTION

The devices which are worn by the individuals, who are interested to keep track of their physical movements and activities and also improve their fitness are popularly known as wearable fitness tracking devices. There has been a tremendous surge in use of these devices in the past decade and it is only projected to rise further more. A wearable device has a biosensor that monitors physiological data, usually with a remote or wireless communication, and as a part of any wearable item that is attached to the body (Martin *et al.,* 2000). These devices are worn with contact to human skin to continuously monitor the individual's activities, without interrupting or limiting their life style (Gao *et al.,* 2016). Wearable fitness tracking devices has been gaining popularity as a tool for promoting physical activity and fitness among young adult population in India. Historically starting with Galvanic Skin response in 2008, the range of wearable devices evolved into varieties such as activity trackers, that measure the footsteps by person wearing the device as well as the steps climbed, tracking the heart rate, calories burnt in the process of a specific physical activity such as running a mile, or jogging for an hour etc. Physical inactivity is one of the identified risk factors for the high burden of non-communicable diseases such as diabetes mellitus type 2, cardiovascular diseases, hypertension, mental disorders. It is the fourth leading cause of mortality and thus revealing the impact of modifying life styles which promote physical activity on reducing the burden of non-communicable diseases. This prompted World Health Organization (WHO) to provide specific guidelines for various age groups and recommended physical activities and their duration (World Health Organization). In adults aged 18-64 years, WHO recommends at least 150 minutes of moderate intensity activities throughout the week. In spite of recommendations from WHO, multiple studies time and again reveal physical activity undertaken by masses remains less satisfactory (Middleweerd *et al.,* 2014). Owing to increased perception of body image due to social media platforms such as Instagram, young adults and adults in the past half-decade have been increasingly taking gym memberships. This trend is slowly gaining acceptance as gyms are also offering various services including personal training to young adults whose goals for physical fitness are inclined towards body appearances unlike in adults whose focus is to maintain ideal BMI and other anthropometric indices to lower the occurrence of diabetes mellitus-type 2, hypertension, obesity etc. Young adults are also most common group of population who favour using wearable devices to monitor their fitness. These devices have inherent design features to constantly monitor the users activity and provide feedback thereby have a potential role to motivate them to reach their fitness goals. Studies also identified that these devices provide

more objective information than self-reported levels of physical activity from the respondents and are thus ideal for monitoring behaviour change programs targeting young adults (Hagstromer *et al.*). Students in professional courses allied with medicine are an ideal group to study their affinity towards wearable devices as they are at the forefront of synergistic linking of technology with life styles with favourable health outcomes such as longevity and improved mental health. Thus we propose a descriptive study to assess the factors associated with usage of wearable fitness tracking devices among health care professionals in India.

Objectives:

1. To determine the usage of wearable fitness devices for tracking fitness among health care professionals
2. To assess their attitudes towards wearable fitness devices acting as a health promotion tool for physical and mental well-being

MATERIALS AND METHODS

A Google docs online survey using a pre-tested questionnaire which included socio-demographic variables, usage patterns of wearable fitness devices, attitudes towards promotion of physical fitness due to wearable devices was designed. The survey link was shared among health care professionals such as qualified and practicing doctors, post-graduate students, interns, MBBS, BDS and physiotherapy undergraduates using social media networks and they were invited to participate in this survey. The respondent data was received in real-time when they submit the survey online and was analyzed. Descriptive statistics like proportions and tests of significance were performed to identify any associations between socio-demographic variables and usage of wearable fitness devices .

RESULTS

The study respondents were 588, comprising of 377(64.11%) in the age groups of 18-22 years and males were 296(50.3%), medical under-graduates were 380 (64.6%) and urban residents were 362(64.3%). Among the study participants, 493 (83.8%) heard of wearable fitness tracking devices and 132(22.4%) respondents ever used a wearable fitness tracking device. Smart watches were leading wearable devices in this study population-70(53%) followed by wrist-band type of devices 62(47.3%). Only 54(35.8%) of ever-wearable device users were using daily to track their fitness. Among ever-users of wearable devices, cumulative improvement in physical activity was felt by 78(52%), 43(28.3%) of the users expressed that it is challenging to use wearable devices and majority 97 (63.4%) would recommend wearable devices to their family and friends as a fitness improving tool.

Proportion of participants, using wearable fitness tracking device for a duration, between 2 months to 2 year were motivated more for being physically active than those using for a period of less than 2 months and more than 2 years respectively, and this difference was found to be statistically significant having a p value of <0.05. Among non-users (74), 38(51.4%) never considered using a wearable fitness tracking device, 36(48.7%) agreed that wearable device can have a positive influence to improve fitness and 39(52.7%) were willing to try on a trial basis.

Table 1. Socio-demographic features of study participants (n=588)

Sl No	Variable	Frequency(%)
1	**Age**	
	18-22 years	377(64.11)
	Above 22 years	211(35.88)
2	**Gender**	
	Male	296(50.3)
	Female	293(49.8)
3	**Education**	
	MBBS-UG	380 (64.6)
	CRRI	83 (14.11)
	PG	45(7.65)
	Professionals-working	41(6.97)
	BDS-UG	39 (6.6%)
	Physiotherapist	39 (6.6%)
4	**Residence**	
	Urban	362 (64.3)
	Rural	82 (14.6)
	Semi-urban	126 (22.4)

Table 2. Usage of wearable fitness tracking devices among study participants

Sl No	Variable	Frequency(%)
1	**Heard of wearable fitness tracking devices (n=588)**	
	Yes	493 (83.8)
	No	98(16.7)
2	**Using wearable fitness tracking device (n=580)**	
	Yes	91(15.7)
	No	450(77.6)
	Yes in the past not currently	41(7.1)
3	**Type of wearable device (n=132)**	
	Wrist band type	62(47.3)
	Smart watches	70(53.0)
4	**Usage of wearable device (n=151)**	
	Current and daily user	54(35.8)
	Current and irregular user	40(26.5)
	Past user	45(29.8)
	Bought the device but never used	20(13.2)

Table 3. Attitude towards fitness tracking devices as physical activity enhancing tools among wearable device users (Likert Scale)

Sl No	Variable	Frequency(%)
1	**Fitness Improved with wearable device (n=150) ***	
	Fairly improved	22(14.7)
	Improved	56(37.3)
	Neutral	54(36%)
	Not improved	19(12.7)
	Fairly not improved	4(2.7)
2	**Challenging to wear the device (n=150) ***	
	Strongly agree	9(5.9)
	Agree	34(22.4)
	Neutral	58(38.2)
	Disagree	32(21.1)
	Strongly Disagree	24(15.8)
3	**Recommend wearables to friends/family (n=153)***	
	Strongly recommend	25(16.3)
	Recommend	72(47.1)
	Neutral	49(32)
	Not recommend	8(5.2)
	Strongly not recommend	8(5.2)

*n varies for each question as per the responses submitted in online survey form

Table 4:Association between duration of using wearable fitness tracking device and being motivated to remain physically active (n=127)

Duration	MOTIVATION		Total
	Motivated	Not motivated	
<2 months	21	6	27
2 month-2 year	80	7	87
>2 years	7	6	13

X^2=15.44, p value <0.01,statistically significant

DISCUSSION

This study attempts to determine the usage of wearable fitness tacking devices and attitudes towards these devices among health care professionals. Mean age of the study participants was 22.01 years with SD 5.629and male respondents to the survey were 50.3%. There were 132(22.8%) who ever used/currently using wearable fitness tracking devices. The published studies mentioned limited use of wearable devices from subjects with and without incentives and our finding also agrees that limited use of wearable devices was found even among health care professionals who are young adults (Finkelstein *et al.,* 2016; Jakicic *et al.,* 2016). Among the 90 current users of wearable tracking devices, smart watches are found to have more popular usage compared to wristband style devices such as Fitbit. A smart watch is also a wrist-worn device similar to Fitbit but is mostly acting as an extension to a mobile phone which also includes features to track physical activity (Richardson and Mackinnon, 2018). Fitbit is a device which is typically cheaper than smart watch but is an exclusive device dedicated to fitness tracking (Richardson and Mackinnon, 2018).The findings from Andre Henriksen *et al.* (2018) reported that Fitbit was more widely studied in validation studies almost ten times as often as other brands (Andre Henriksen *et al.* 2018). This provides an estimate of Fitbit brand devices being more popular rather than other brands (Wagenaar *et al.,* 2011) compared to our study where smart watch is most commonly used.

The health care professionals who ever heard of wearable devices for fitness tracking was high (83.8%) compared to 132(22.8%) who ever used a wearable device. This huge gap is really insightful in that it is presumed that being a health care professional might motivate them to adopt technology driven tools to enhance physical activity, and it is not seen in this study group. Median duration of the use of the device in this group was 8.23 months with SD 8.14. The study finds that the uptake of these devices is currently very minimal as only less than a quarter of the study respondents were wearing fitness tracking devices to promote physical activity and the mean duration is also less than a year in this group. This could be due to the attitudes among health care professionals that 'devices' need not be guiding their activity related behaviors and majority may be having self-determination driving physical activities without using device as a motivation tool. But evidence from studies shows that physical inactivity causes 6% deaths globally (World Health Organization, 2016). A word of caution is that studies also identified that people tend to over-estimate their physical activity-related behaviors and life styles (Godino *et al.,* 2014; Vooijs *et al.,* 2014). In this context, adoption of wearable fitness tracking devices may prove to be the game changer, where objective measurements of real time activity and feedback with alerts and reminders might actively contribute to positive habit formation towards regular physical activity. The majority (52%) users of wearable fitness tracking device admitted that wearing the tracking device motivated them to improve their physical activity. This is in congruence with a study among gym-goers who also admitted that trackers do support them with some benefits in maintaining regular physical activity though not completely on its own (Kettunen *et al.,* 2017). The challenges reported for regular usage of wearable devices are charging the device, wearing the device all throughout the day, unable to tracking calories burnt during swimming or water sports. This is similar to various studies which reported similar technology-based challenges related to battery power of the device (Harrison *et al.,* 2014) and user experience and perceived ease of the wearable device (Clawson *et al.,* 2015; Lazar *et al.,* 2015). These factors do determine the uptake of these devices and as technology evolves these can be addressed adequately too. In this study we found that, respondents using wearable devices in the duration of 2months to 2 years expressed the device and its feedback acting as a motivation tool to promote physical activity. Sander Hermsen et al in their study opined that user likeability of the device leads to sustained use (Sander Hermsen *et al.,* 2017). Thus if the challenges such as pricing, battery life and under water usage are addressed and if these devices are brought into the ambit of affordable range maybe there might be more takers as is seen in the attitudes of non-users as depicted in Table 4.In a contradictory finding from Charlotte Kerner *et al.* (2017) study, found significant amotivation in a group of adolescents after eight weeks of use of wearable devices suggesting healthy life style technology may have negative motivational consequences (Charlotte Kerner *et al.,* 2017). In another similar study by the same authors they also reported that calories burnt and daily step count did not sustain users interest beyond a few weeks (Victoria, 2019). The study determined the use of wearable fitness tracking devices and attitudes towards these devices in promoting physical activity among health care professionals. Users of these devices perceived that they were able to sustain and enhance their physical activity as these devices act as motivational tools and majority would recommend these devices to family and friends. Key challenges quoted were the low battery life of the devices requiring constant charging, and inability to use in water sports and the necessity to wear it on the body all the time.

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