Consumer Perception Towards Wearable Medical Devices in India

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Abstract - This study investigates consumer perception and adoption of wearable medical devices (WMDs) in India, exploring factors influencing awareness, purchase, and usage. A survey of 186 respondents reveals varying levels of awareness across different fields, with sports/fitness and medical/wellness showing the highest awareness. Online platforms are the primary source of purchase. Males exhibit greater familiarity with WMDs than females. Pearson's correlation analysis shows a weak association between perception towards WMDs and healthy lifestyle habits, indicating that attitude towards WMDs does not significantly impact healthy lifestyle choices. The findings provide insights for manufacturers, marketers, and healthcare providers to develop targeted strategies for increasing adoption and usage of WMDs in India.

I. INTRODUCTION

Multiple studies have been conducted to ascertain individuals' opinion of a healthy lifestyle. The World Health Organization (WHO) defines health as a condition characterized by holistic well-being including physical, mental, and social aspects (Chong et al., 2020). Individuals' perceptions of their own health significantly influence the level of care they prioritize in order to maintain a healthy lifestyle. "Perception of health" refers to how individuals comprehend and interpret their state of well-being. Peoples' perspective of health refers to their viewpoint or assessment of how they see and value health. An individual's perception of health is significant since it directly influences their actions and conduct. There is a strong correlation between health and experiences, which may differ depending on factors such as age, profession, income, gender, and other demographic variables. Therefore, individuals' views on health and wearable devices may differ depending on demographic factors (Ferreira et al., 2021). The objective of the study is to collect insights on whether demographic factors might impact individuals' perception of wearable technologies.

Wearable gadgets are electronic devices that may be worn on the body as accessories. Wearable electronics such as Fitbit, Apple Watch, wrist bands, and smart garments are examples of wearable technology. They may manifest as spectacles, timepieces, garments, affixed to footwear, jewelry, or even unadorned hand coverings. There are two types of health care wearable devices. There are two types of wearable electronics. The first kind is fitness wearables, which track sleep, steps, distance, food, and calories burned. The second type is medical wearables, specifically developed to cure illnesses such as diabetes, cancer, and heart disorders (Kalantari, 2017). Companies such as Apple, Samsung, and Google are engaged in ongoing research to produce medical wearable devices, since they have the potential to be novel solutions for addressing health problems. These wearable gadgets are equipped with software that has the capability to save data and may also be shared with colleagues or insurance providers. The acquired data is referred to as "quantified self," indicating that the measured data may lead to lifestyle adjustments that can have positive effects on one's health. The study seeks to compare the real lifestyle with quantified self and status. Prior studies have shown that consumers have a restricted inclination to embrace wearable technologies (Kalantari, 2017). The majority of empirical investigations have focused on the technology acceptance model (TAM) in relation to wearable devices. This research examines the views of individuals about wearable devices.

II. LITERATURE REVIEW

Kumar and Venkateshwarlu (2017) conducted research to investigate customers' purchasing intentions for smart watches. In order to address this, a systematic questionnaire was developed for the main data collection in the research. The findings indicated that respondents were knowledgeable with smart watches and had a favorable inclination towards purchasing one. The findings revealed that a significant percentage of the participants are drawn

to the "convenient music or video selection" capability of smartwatches. Over 33% of the respondents said that notification notifications are a very appealing feature. The participants also agreed that wearing a smart watch is a way to express one's sense of style. Respondents expressed a desire to get a smart watch in the future and had a favorable disposition towards this technology. Kalantari (2017) posited that wearables devices have been progressively advancing as smart gadgets that have the ability to impact the lifestyle, welfare, and behavior of customers. The adoption of smart wearables is somewhat slower than that of other technological gadgets, such as smartphones. The study determined that previous research has mostly focused on the factors influencing the acquisition of smartphones but has largely overlooked the decision-making process of consumers when it comes to purchasing smart wearables.

Cheung et al. (2019) suggested that consumers tend to embrace mobile phones earlier than wearable healthcare technologies. The research used the equipment Acceptance Model (TAM) to investigate how privacy protection and health attitudes influence the perceived usefulness of wearable medical equipment. This research was conducted in Hong Kong using convenience sampling to gather data using popular social media platforms such as Facebook, WeChat, and Instagram. In addition, the research aimed to examine the impact of perceived utility and innovativeness on customers' desire to use wearable healthcare technology. The findings provide tips that marketers may use to improve the sales of wearable healthcare technologies. Fricker and Deshayes (2018) did research with the goal of proposing new marketing techniques for smart wearables by identifying the specific traits of customers who are more inclined to buy these products. In order to accomplish the goals of the research, a survey consisting of sixteen questions pertaining to the adoption of smart wearables was formulated, and an online link was generated on the Google Form platform. This research was conducted in France; hence the questionnaire was created in the French language. In addition, respondents also supplied responses in the French language, which guaranteed the consistency of the data. The findings indicated that 76.1 percent of the participants use smart wearables on a daily basis, whereas 37 percent of them said that smart wearables suffer from insufficient battery life.

Smart watches are considered to be an increasingly significant wearable device, serving as both a new IT product and a fashionable gadget (Choi and Kim, 2016). Smart watches are regarded as a fusion of cutting-edge information technology with fashionable accessories. The research aimed to examine the factors of fashion items that influence customers' purchase intentions for smart watches, based on the aforementioned issue. The research aimed to enhance the technology acceptance model (TAM) by integrating two distinct categories, namely reported satisfaction and perceived self-expression. The study's framework was established using TAM. The findings indicated that the attributes of smart watches as a fashionable accessory strongly influenced customers' inclination to purchase smart watches. The primary determinant of customers' propensity to purchase a smart watch was identified as their need for uniqueness. The study revealed that participants do not see smart watches as a premium item. Laddha (2018) said that home fitness equipment refers to machinery used for exercising at home, including systems that aid in monitoring physical activities throughout workouts. The inconvenience of commuting to a fitness center to make use of the exercise machines, expenses for personal trainers, and membership fees have together led to the recent surge in popularity of home exercise equipment. Customers may locate fitness centers in densely populated residential areas where parking is a significant challenge in major cities such as Mumbai and Delhi. The objective of this research is to analyze the fitness business and client perceptions about at-home workout equipment. Secondary data is used to understand the market situation. Research indicates that people prioritize size, price, and quality as key factors when making purchasing decisions. The brand name is a relatively little factor in a consumer's purchasing decision. Businesses must have a thorough understanding of market expectations in order to develop goods that effectively cater to customer wants.

A medical wearable device is used to monitor vital signs, such as blood glucose level, blood pressure, pulse rate, electrocardiograph (ECG) patterns, respiration rate, and respiration effectiveness (e.g., blood oxygen saturation). This device is applicable in fitness monitoring and medical diagnostics (Nanda and Som 2018). Medical gadgets are valuable tools, but their popularity in India is hindered by a lack of understanding. Metropolitan regions serve as the primary markets for these devices. This research examines the amount of knowledge on the suitable demographics and specifically focusses on the awareness of medical wearable devices in Delhi-NCR. Furthermore, this study delineates the pivotal aspects that influence the acceptance of this technology, including education, qualification, and buying power parity. In their study, Mahalaxmi and Ranjith (2016) investigated the impact of digital marketing on consumer purchase decisions. They aimed to determine if consumers are cognizant of digital marketing and whether digital channels had an effect on their buy decisions. Research indicates that customers are knowledgeable about digital marketing and prefer doing electronic and retail transactions via digital platforms. The research is limited to a certain geographic location, which may be a challenge when assessing the purchasing choices of customers from different areas.

Almuraqab (2021) conducted a study in the Dubai market on Smart Wearables, emphasizing the significance of technological adoption in consumer behaviors and its role in influencing purchase intentions. The examination of the Technology Acceptance Model (TAM) included other variables such as cost and social impact. An analysis was conducted on smart watches, focusing on their technological and psychological aspects. The study determined that the combination of technology and fashion plays a crucial role in motivating the purchase of smart wearables. Visibility has been identified as a significant aspect in analyzing customer behavior in this market.

Afroz & Wahl (2019) examined consumer behavior in the German market. The results indicate that the most reliable indicator of the inclination to purchase smart watches was the individual's attitude towards utilizing the smart watch. The results indicated that three aspects, namely perceived pleasure, design aesthetics, and utilitarian element (perceived utility), influence attitude. The study revealed that the level of perceived pleasure had the most significant influence on attitude. Furthermore, it was shown that customers' propensity to purchase was influenced not just by their attitude, but also by their perceived behavioral control.

Wearable gadgets possess certain distinguishing characteristics that set them apart from other technical items. In order to comprehend the future implications of these gadgets, it is crucial to analyze the attributes of such devices. The primary feature of these wearable devices is their hands-free functionality. The benefit of the hands-free feature is the capability to access info while engaging in regular tasks. The notion that consumers would readily adopt wearable technology is a fallacy. It is important to provide individuals with education on the practicality of these technologies. It is important to ensure that they comprehend the distinct and exclusive advantages that wearable gadgets may provide, which are not available with other devices. Wearable devices are used in close proximity to or directly on the human body to detect physiological and psychological data (Spagnolli et al., 2014). Certain wearable gadgets include small wearable sensors that are integrated into clothing to constantly track human activities. PWC performed a study of 1000 US customers to investigate consumer behavior and ascertain their preferences. The poll revealed that the primary advantage of wearable devices is the opportunity to enhance productivity, self-connectivity, efficiency, health, and wellbeing. The poll revealed that 45% of participants used fitness bands, 27% utilized smart watches, 15% utilized smart glasses, 14% utilized smart video/photo devices, and 12% obtained their health data via smart clothes. The concept of Quantified Self has gained significant popularity since 2013, with a growing number of individuals worldwide engaging in the practice of measuring their everyday activities in order to get valuable information about their well-being. Quantified self refers to the practice of gathering data through the use of technology such as sensors and wearables in order to get insights into one's health and fitness. The objective of quantified self is to enhance self-awareness, self-monitoring, and human activities via the use of health tracking technologies. It operates based on the concept that if you are able to measure something, you are also capable of making changes to it. The data is often shown using basic visualization methods and does not need advanced technological skills. Analysis of the data may facilitate the identification of lifestyle modifications that can contribute to improved health and well-being. Critics contend that self-tracking may result in reductionist interpretations of intricate concepts like health and self-identity, where objective facts and numerical values take precedence over subjective or intuitive experiences.

While not everyone may be enthusiastic about adopting self-tracking for health and fitness, the debates around the use of self-tracking for health have attracted significant attention in medical and public health literature.

Due to the novelty and popularity of wearable devices, there is a scarcity of empirical research examining consumers' intents to buy and adoption of these technologies. In their study, Ko et al. (2009) investigated how the perceived dangers and advantages of smart shoes and jacket wearable technology influenced individuals' attitudes and intentions to acquire these products. The research conducted by Ko et al. (2009) on perception of wearable devices reveals that people's attitude towards their intention to buy is favorably affected by compatibility, but the perceived complexity of the gadgets has a negative impact on the purchase intention. Turhan (2012) uses the planned behavior and technology acceptance model to investigate the adoption of wearable electronics. Turhan's research demonstrates that perceived usefulness has an indirect impact on purchase intention. Park and Chen (2007) corroborate Turhan's findings, asserting that an increase in perceived usefulness results in a favorable user attitude towards wearable gadgets, subsequently leading to their positive usage. In his research on perception and adoption of wearable electronics, Chae (2009) used an extended technology model. In his research, he finds that perceived utility is the primary factor that affects customers' attitude towards wearable technology. The extent to which individuals see a gadget as beneficial influences their level of utilization in their everyday activities. Can an individual's ego or social position influence their consumer purchasing decisions?

Freud defines the Ego as a constituent of an individual's personality. According to him, ego is a fabricated identity that one adopts in order to seem attractive to others and get their attention and approval. For some individuals, wearable devices may serve as a means of augmenting their personality, resulting in a sensation of being superhuman.

A study conducted by PWC revealed that 14% of the individuals polled used wearable technologies due to their perceived stylishness. Research on the correlation between wearable devices and ego fulfillment is still lacking.

In contemporary times, wearables have gained popularity among those who adhere to healthy lifestyles, since they want to track their health and measure their development. Many wearable manufacturers claim that their technology is a comprehensive solution for both physical fitness and good behavior's. Choi & Kim state that some wearable gadgets have the ability to distinguish users due to their status as fashion goods.

Gadget makers use user engagement tactics like as tournaments, challenges, and gamification activities to attract consumers. Wearables have been praised as data-rich devices that have the potential to transform medicine by providing valuable health insights. However, it is possible that, like other technology revolutions, these gadgets may eventually lose popularity. Wearables may be described as a solution that is seeking an issue to solve. A significant amount of work is dedicated to comprehending their operation. Therefore, they do not contribute much to the functional value. Contrary to the article "Future of Wearable Technologies," another perspective suggests that wearable devices will inspire collaboration among major industry leaders to develop advanced wearable gadgets capable of offering a diverse variety of solutions. The primary concern of wearable device consumers is in the functionality provided, rather than the brand or price of the product. The user's text is simply the number 17.Certain devices, such as smart watches, gather data on the user's physical activity, which is often seen as a potential invasion of privacy. However, simultaneously, these wearable devices aid customers in terms of health and medical aspects.

III. RESEARCH METHODOLOGY

A preliminary investigation was carried out by using various search terms to compile a selection of pertinent academic publications from sources such as Google Scholar, Springer, IEEE, Elsevier, Emerald, and other online databases. A logical framework is built based on both primary and secondary data, focussing on the gap between the current degree of awareness and acceptance. As to the findings of the IoT India Congress study, health should be seen as an ongoing process rather than a singular occurrence. In India, individuals purchase healthcare based on two factors: their perception of the severity of their health condition and their perception of their vulnerability to health issues. Data is gathered by using the postal questionnaire approach from a sample of 186 respondents. Sampling is conducted using the stratified random sampling technique. The snowball approach is used to get the necessary sample size. The Cronbach alpha is used to assess the reliability of the data. This research focusses only on India.

IV. FINDINGS

Variable	Frequency	Percentage
Security	5	5
Fashion	13	13
Sports/ Fitness field	42	42
Medical/Wellness	53	53
Implants	0	0
Total	**100**	**100**

Table 1: Awareness

When survey participants are queried about their level of familiarity with wearable technology or wearable devices in certain areas of knowledge. The level of awareness was greatest in the sports/fitness area, followed by the medical profession which had the second highest level of knowledge. The security industry has the least amount of understanding about such gadgets. None of the respondents were aware of the existence of implanted wearable devices.

Variable	Frequency	Percentage
Internet	47	47
Sports good showroom	20	20
Electronic showroom	15	15
Pharmacy	18	18
Total	**100**	**100**

Table 2: Source of purchase

The data clearly indicates that 47% of all participants obtained their wearable gadgets online, while 20% acquired them via sporting goods showrooms, 15% from electronic showrooms, and 18% from pharmacies.

Gender	N	Mean	Std. Deviation	Std. Error Mean
Male	27	3.60	1.143	.162
Female	73	3.59	.954	.082

Table 3: Familiarity in context to gender

Regarding familiarity with wearable devices, it is evident that men exhibit a greater level of familiarity compared to females. This is further supported by the larger standard deviation among males, indicating a greater variety in their cognitive processes.

		Daily exercise	Meditating daily	Proper Sleep	Avoiding junk food	Eating healthy	Work life balance
Perception	**Pearson Correlation**	.081	-.139	-.089	-.092	-.113	-.124
	Sig. (2-tailed)	.272	.058	.228	.211	.123	.091
	N	100	100	100	100	100	100

Table 4: Correlation coefficient

Pearson's correlation was conducted to see whether there is a link between perception towards wearable devices and a healthy lifestyle. The investigation revealed a modest association between these two factors. The results indicate that an individual's impression of wearable devices does not have any impact on their healthy lifestyle. Most of the factors associated with a healthy lifestyle exhibit a negative connection. This further supports the notion that one's view of wearable gadgets is unrelated to maintaining a healthy lifestyle. The factors of healthy living have a significance level above .05, indicating that they are not statistically significant. An individual's decision to adopt a healthy lifestyle is not influenced by their attitude towards wearable devices.

V. CONCLUSIONS

The degree of awareness among consumers is influenced by several aspects, including their personal features such as age, gender, and profession, as well as factors including lack of product experience, small market impact, health awareness, poor trust level, and high use of smart phones. The sort of value proposition supplied by medical wearable technology has a significant impact on customers' motivation. It is crucial to educate consumers about the medical benefits in order to encourage early adoption.

VI. REFERENCES

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