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## Qualitative study to analyze the pros-cons and consumer's perception towards mHealth apps

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### Abstract

After the mobile revolution, mobile phones become the need of every person. In this century we can't imagine our life without a phone, specifically in the era of smartphone. For 2017, the number of smartphone users in India is estimated to reach 340.2 million, thanks to the robust mobile technology and the availability of 3G & 4G services at affordable prices. mHealth or mobile health is the use of personal wireless communication devices, including smartphones and mobile phones, smartwatches, tablets, wireless sensors worn by an individual, and point-of-care devices, to support continuous health monitoring, provide health information & services, feedback, and behavior modification of individuals and populations. Mobile health applications (mHealth apps) are classified under two main categories: those targeted on wellness like diet & exercise & those which focusses on disease management. The objective of this study to know the consumer's perception towards these health and wellness apps.

**Keywords:** mhealth, consumer's perception, health & wellness apps, smartphone

### 1. Introduction

India is a developing nation with second largest populated country in the world. Two thirds of India's population is living in rural areas. Demographic and environmental alteration in India is expanding, the already existing high burden of communicable, non-communicable and emerging infectious diseases [1]. In recent years India has made progress in improving overall health care sector. Barriers like large geographical area, high population density, lack of transport facilities, inadequate nutrition, illiteracy and poverty directly impacts in achieving good quality healthcare. There is a differences in urban-rural health condition in terms of infant mortality rate and crude death rate, a harsh reality of today [2]. Substantial disease burden, inadequate human resources, less number of health care providers at government facilities, inaccessibility to quality healthcare by rural people extends the existing hardships in health care delivery in the country [3-5]. Healthcare delivery requires an urgent need in health care delivering with enabling referral systems with information communication technology applications. Telemedicine is being widely used to provide healthcare services and enabling health care providers working in primary level however, implementation of telemedicine is restricted to some private and tertiary care public hospitals [6]. Also, the cost of teleconsultation is too high to introduce in remote healthcare settings [7].

Over the past decades, mHealth has seen a significant progress and is mainly due to the growing usage of mobile phones. Presently, the number of mobile subscribers worldwide is expected to have extended over 7 billion, of which 1 billion are smartphones with mobile broadband connections. Almost all developed and some developing countries have mobile penetration greater than 100%. The expectations are high for mHealth for both developed and developing regions in the world. According to the Economist Intelligence Unit (2012), mHealth can escalate access to care in emerging markets and transform the developed world's costly healthcare burden into less expensive, prevention-based and patient-focused systems [10]. Healthcare system in India is ripe for innovation. The capability of the healthcare system to deliver care is unlikely to meet both the demands of the growing urban middle and upper classes, or the needs of the urban and rural poor. About 75% of healthcare costs paid out-of-pocket create a consumer-driven market capable of fast change. Using technology to enable greater access to care at a lower price point is critical.

### 1.1 Stakeholders of mHealth app

#### 1.1.1 Consumers and Patients

Consumers are the main target for these apps mainly (health & wellness), as variety of apps are available in the app store.

Yet majority of them are facing problems towards their adoption, Connectivity within the app space between consumers, devices and healthcare providers is very crucial for leveraging mHealth apps as a component in maintaining long term, disease prevention and management as well as maintaining overall healthcare costs [11]

**1.1.2 Physicians/ Providers**

Physicians are the gatekeepers to health information & treatment as well as the patient’s advocate. But when it comes to recommending or prescribing health apps they remain skeptical about their utility because they have not yet seen evidence which confers the efficacy of apps or to increase their confidence in prescribing mHealth apps [11].

**1.1.3 App developers and start ups**

The apps which are available to the general public are created by variety of developers with an idea of targeting different consumers with different ailments. Since the market of mHealth is flourishing (developing rapidly) so the capitalization and return on investment are high for

consumer’s health apps. But the major challenge for an app developer is combining health care industry knowledge and experience with health IT. [11]

**1.1.4 Big pharma and biotech**

2013 was the year for the apps launched by big pharma & biotech companies. Earlier apps were launched first at Apple app store than Google Android. But later on, they go simultaneously on both the platforms. Examples of these apps include:

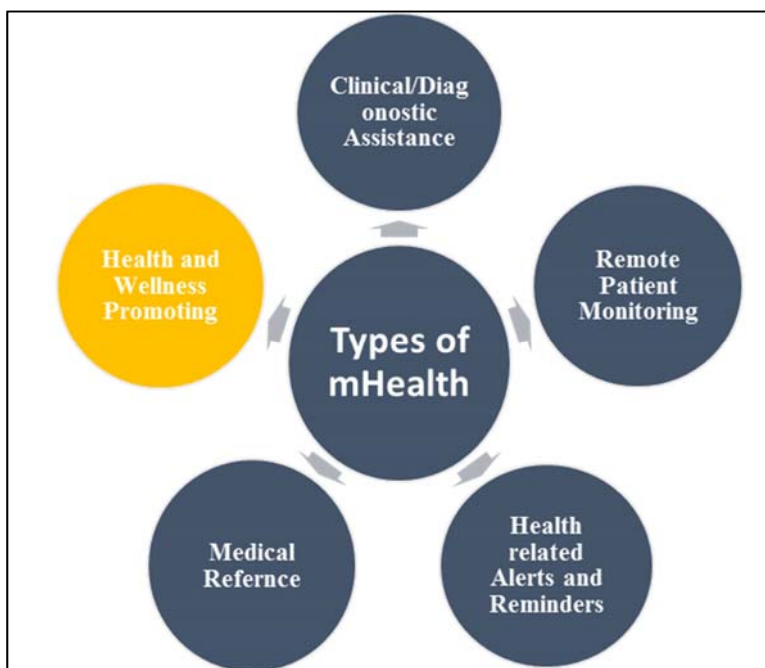
AstraZeneca’s Grace 2.0: AstraZeneca created an app GRACE 2.0 (Global Registry of Coronary Events) which can be used by Healthcare providers to identify high - risk heart patients. The availability of app was on both the platforms Android & Apple simultaneously.

Janssen’s Care4Today: In August 2013, Janssen the subsidiary of Johnson & Johnson released version 2.0 of its health management app, Care4Today. This app can send alerts to the family members when someone doesn't take their medication and it also produces the charts showing adherence to treatment regimens. [11]

**Table 1:** Different stakeholders of mHealth industry

Stakeholders	Who	Expectations
Policy makers	Healthcare organizations (e.g. Hospitals) Healthcare regulators (e.g. Ministries) Health insures or funders	Cost- effectiveness
Users	Healthcare providers Patients or consumers	Clinical outcome
Developers	Technology suppliers Innovation companies	Profitability Improved outcomes

**1.2 Types of mHealth apps**



**Fig 1:** mHealth and its type

Apps like clinical assistance have various functions, such as allowing doctors to check EHRs (electronic health record) or access lab results during an appointment. These apps may also help in patient education and image viewing. The basic kind of app that can be used as a way to remind patients of appointments or when to take medications is reminder apps. Monitoring apps: These apps allow doctor to pay attention or

observe the behaviour or symptoms of patient remotely. For example, a patient with the help of an app can take an ECG and then send the results to his or her doctor. Probably the oldest and widely used kind of apps are reference/database apps which help doctors to follow up drug dosages or symptoms. Another and most popular type of app for health conscious people is health & wellness apps comprise of

fitness and diet apps, as well as other types of apps, healthy life apps are largely used by patients rather than by doctors [11].

**2. Materials & Methods**

**2.1 Participants**

54.5% of respondents were male & 45.5% female. Respondents were from the age group of below 20, 20-30, 30-40 and above 40 years. The majority of respondents were

found within the age bracket of 20-30 years. The respondent further had an education level: 32.4% undergraduates, 39% graduates & 28.6% postgraduates with different socio economic backgrounds. The respondents further sub classified under different categories as students, health care professionals, government & private sector employee, businessman & homemaker.

**Table 2:** Participant demographics

Characteristics	Subcategory	Number
Gender	Female	90
	Male	110
Age (Years)	>18- 20	32
	20- 30	137
	30-40	16
	40-50	5
	>50	10
Total participants		200
Smartphone operating system	Android	170
	iOS	30
Language	English	All
Education	Undergraduates	66
	Graduates	73
	Postgraduates	61
Occupation	Government employees	9
	Private employees	61
	Business owner	6
	Healthcare professionals	14
	Homemaker	5
	Students	90
	Others	13

**2.2 Procedure**

This study explored consumer’s perception and experience with health apps through structured questionnaire. Questionnaire was made to analysis the consumers perception of mHealth apps. Survey was aimed to target 210 consumers, and we got responses from 200 consumers which we interpreted and analysed to derive our objective of study.

Design of questionnaire: Questionnaire was structured with closed ended questions in a simple language (English). Questions were framed for consumers behaviour and perception towards mHealth apps targeting mainly health and wellness apps. Eleven questions were asked from sample population which took time maximum 5 mins to fill survey. Questionnaire had two sections: First section was to know about background of consumer and latter part comprises of questions related to the study.

Survey of questionnaire: Distribution of questionnaire was done through web like mailing, sending links via messengers. Target was randomly chosen sample population which includes college students, working professionals, homemakers and old age people.

**2.2.1 Inclusion criteria**

1. Consumers must have a smartphone
2. Consumers should have minimum 18 years of age. It was intended to involve participants of broad age range to combine experiences of technology savvy younger generation with the older generation
3. Any duration of use of the apps was valuable
4. Consumers residing in urban area (Delhi/NCR)

**2.2.2 List of Exclusion criteria’s**

1. Data collected only for health and wellness apps and not medical apps
2. Age group <18 years

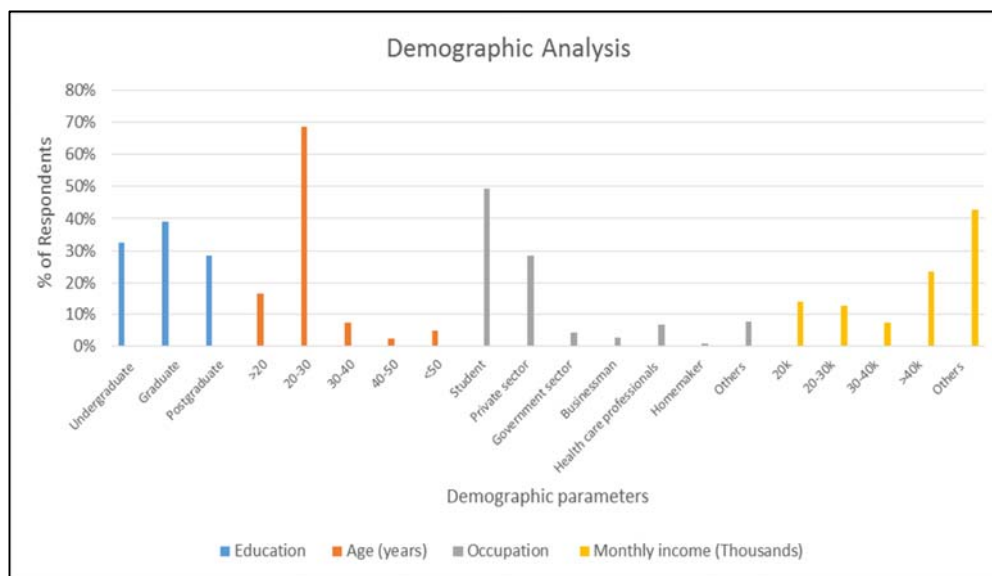
**2. Data Analysis**

Data from survey was collected and compiled for analysis. We used excel to compile survey data and made graphs to compare the outcomes. Data was separated in two sections:

1. Questions related to demographics
2. Questions related to mHealth apps

Results were concluded on the basis of data analysis.

### 3. Demographics Analysis



In sample population we found majority of responders were in age group of 20-30 and were students.

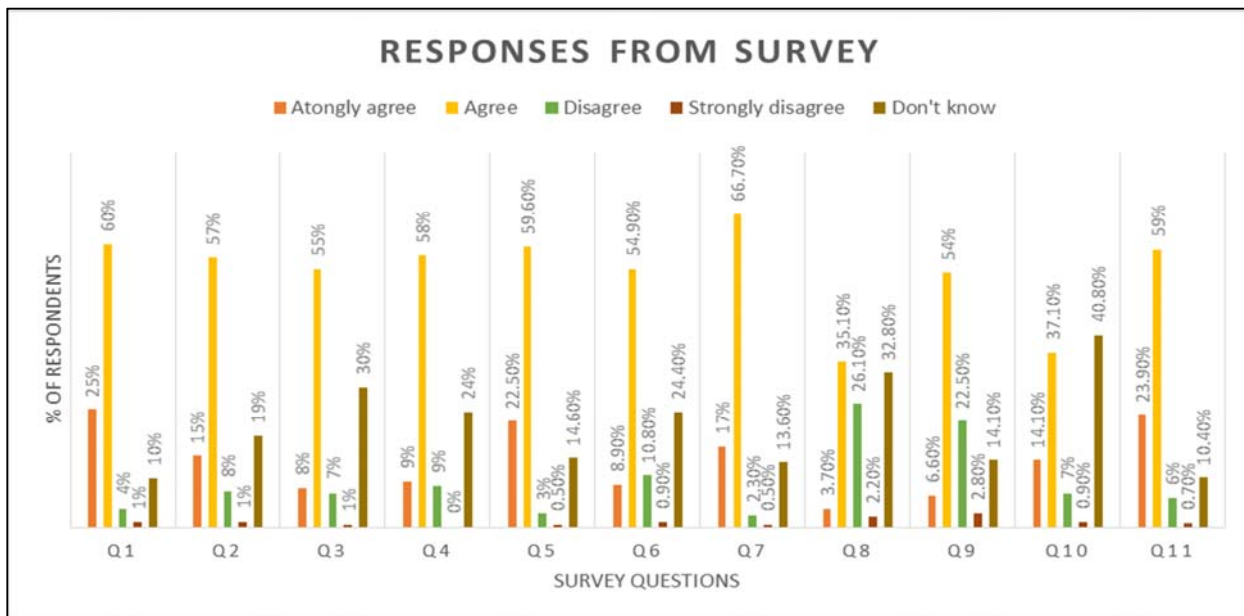
**Table 3: Demographic Analysis**

Factors	Sub-category	% of Respondents
Education	Undergraduates	32.4%
	Graduates	39%
	Postgraduates	28.6%
Age	>20	16.8%
	20-30	68.6%
	30-40	7.4%
	40-50	2.4%
	>50	4.8%
Monthly Income	20k	13.9%
	20-30k	12.5%
	30-40k	7.2%
	>40	23.6%
	Other	42.8%
Occupation	Student	49.3%
	Private sector	28.6%
	Government sector	4.2%
	Businessman	2.8%
	HCP	6.6%
	Homemaker	0.9%
	Others	7.6%

**Table 3: Survey questions**

Q. No.	Questions	Response				
		Strongly agree	Agree	Disagree	Strongly disagree	Don't know
1	Access to smart phone is seen as main driver for mHealth apps	24.9	60.1	3.8	0.9	10.3
2	Do you agree exercise, fitness, calorie counter and symptom checker are the widely downloaded or preferred mHealth apps	15	57.3	7.5	1	19.2
3	Do you agree the information provided by the mHealth apps are useful and reliable?	8	54.9	7	0.5	29.6
4	Is mHealth apps aids in improving health care system?	9.4	57.7	8.5	0	24.4
5	Remote access to medical information, customized features and health tracker are the biggest attraction for using mHealth apps?	22.5	59.6	2.8	0.5	14.6
6	Do fitness tracker improve health?	8.9	54.9	10.8	0.9	24.4
7	Convenience, cost & quality of service are the key benefits for using mHealth apps?	16.9	66.7	13.6	2.3	13.6
8	Physicians or healthcare professionals are encouraging people to use mHealth apps in managing their health?	3.7	35.5	26.1	2.2	32.8
9	Do you agree that mHealth apps have become a part of your day to day lifestyle?	6.6	54	22.5	2.8	14.1
10	Diabetes & Cardiovascular disease are the diseases in which mHealth apps are widely used?	14.1	37.1	7	0.9	40.8
11	Is lack of interest and lack of information are the barriers on adoption of mHealth apps?	23.9	59	6	0.7	10.4

Below bar graph is the representation of responses from survey.



#### 4. Results

- This study has established that health management with using an app requires constant stimulation.
- There are many apps for health and wellness but this found that the most of the consumers are not aware of health apps use
- Among the participants these were the factors which were identified as following:
  - Age:** Results of survey found that the responders from the age group of 20-30 years was the active participants and aware of these apps and utilize these apps to track their health as compared to any other age group. The reason being that these age group had highest no. of smartphone adoption.
  - Income:** This factor may or may not be influencing the affordability for buying a smartphone with latest technology which will directly and indirectly related with the usage of Health and wellness apps. Income would play major role as some of the apps are not free of cost so it will act as a barrier.
  - Occupation:** In sample population, major section is of young age group which were found to be more tech savvy and keen to use these apps to track and monitor their health.
  - Education:** It had a major impact on adoption of mHealth apps as the technology and terminology requires basic knowledge, consumers who were not well educated is not motivated towards these apps as compared to the one who is well educated and aware of apps.
  - Awareness:** Through survey we got to know that there is majority of sample population who are not aware of these kinds of apps that can help to manage health themselves. Also, lack of awareness and the lack of motivation are the major challenges in implementing Health apps.

#### 4.1 Barriers and Motivators

##### 4.1.1 Barriers

- Low awareness of health apps:** From the study it was found that majority of consumers are not aware of these apps despite of having a smartphone. They didn't feel the need to use a health app, because they are not motivated

or interested towards it.

- Lack of app literacy:** Most of the participants did not know which app to choose or what kind of app is suitable or appropriate for them. As the app store is loaded with thousands of app.
- Lack of time and effort:** Through study it was found that continued use of app requires time and effort and therefore people uninstall it because they are not willing to spend much time and efforts into it.
- Lack of motivation:** Majority of participants felt that continued use of an app requires lot of dedication and motivation because after some time, its task becomes tedious and boring

##### 4.1.2 Motivators

- Information and personalised guidance:** This feature is mostly preferred by the participants as majority of consumers prefer apps for informational purpose.
- Social competition:** The major driver for the adoption of health apps is peer reviews and social competition. It can be seen as a driving force for younger generation if their family and friends are using any such apps.
- Reminders:** The feature which is appreciated by most of the participants. It found to be useful for those who were busy in their schedules.
- Tracking for awareness and progress:** From the study participants felt that they prefer apps who helped them to measure their day to day activities. As many apps have in built feature to track user's activity like diet & exercise.

#### 5. Conclusion

This study found that healthy young adults were interested in using health apps to support health-related behaviour change. Potential users expected health apps to be accurate, secure, legitimate and able to record and track goals and behaviours. They also expected health apps to require minimal effort to operate and have the ability to acquire advice and information on the go. From the perspective of health and fitness app developers as well as health educators or researchers, it is important to understand what predicts or prevents health app adoption and continued use so as to better design and promote them.

The future of mHealth depends on platform compatibility/availability, consumer attitude/ adoption, and regulatory action. mHealth market is niche or untapped market and the obstacle is more of a marketing problem that requires more of scientific evidence for measuring usability and accuracy of apps, users friendly platform considering preferences, data privacy, and security. If these types of applications successfully implemented in individuals lives with adaptable healthcare infrastructure, there is boost in the productivity of health management and significant reduction in healthcare costs.

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