Content available at: https://www.ipinnovative.com/open-access-journals

IP International Journal of Comprehensive and Advanced Pharmacology

Journal homepage: https://www.ijcap.in/

Original Research Article

Comparison of utility of tobacco cessation mobile applications with regard to Indian scenario

Shashwat Jaiswal[1], Sandeep Narwane[1], Rahul Kunkulol[1], Anup Kharde[2,*], Motilal Tayade[3]

[1]*Dept. of Pharmacology, Dr. Balasaheb Vikhe Patil Rural Medical College, PIMS(DU), Loni, Maharashtra, India*
[2]*Dept. of Community Medicine, Dr. Balasaheb Vikhe Patil Rural Medical College, Loni, Maharashtra, India*
[3]*Dept. of Physiology, Dr. Balasaheb Vikhe Patil Rural Medical College, PIMS(DU), Loni, Maharashtra, India*

ARTICLE INFO

Article history:
Received 15-08-2023
Accepted 27-09-2023
Available online 02-11-2023

Keywords:
Tobacco cessation
Cessation application
Mobile
Craving management
smoking cessation

ABSTRACT

Introduction: The study was aimed to determine perceptions and reviews of the currently available tobacco cessation mobile applications (apps) by online and on-field surveys.
Materials and Methods: In Phase I, the most commonly used tobacco cessation applications with the highest rating from Google Play Store were selected. The most relevant, positive and critical reviews of these apps were recorded. In Phase II, tobacco users with smart phone & internet connectivity and ready to give verbal consent were included in the study. The same apps were allocated to the study participants. At the end of the 2nd week of app use, the participants were subjected to a questionnaire for feedback on liked, disliked & most used features, frequency of app use, utility, expectations, and suggestions for app.
Results: The selected apps were QuitNow, Smoke Free, Quit Tracker, Stop Smoking – EasyQuit and Quit Smoking – SSC. The positive responses in Phase I were customer support, tracking statistics, reward system, craving management, user friendliness, and informative. The negative responses were lacking customer support, less user friendly, pushing for in-app purchases. In phase II, 40 tobacco users were included. 8 study participants were allocated for each app. The liked features were time, health & money, tracking, and gaming feature. The disliked features were advertisements (adds) and language barriers. The suggestions/expectations of study participants were removal of adds, user-friendliness, craving management, and local language.
Conclusion: Our research compared and analysed few of the most used tobacco cessation applications used by millions of users but still could not find an ideal tool to deliver the aid for tobacco cessation through the mHealth approach. Use of pros & unique features and mitigation of cons may prove helpful for increasing compliance. An approach should be taken to understand more of the user's perspective and expectations rather than seeing it as a commercial opportunity.

This is an Open Access (OA) journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprint@ipinnovative.com

1. Introduction

Nearly 267 million adults (29%) in India consume tobacco.[1] Tobacco use accounts for over 1.35 million deaths every year. Smokeless tobacco is more commonly used among Indians as compared to Smoked tobacco.[2]

Various intervention programs are being carried out in India for tobacco cessation. One of such interventions is Mobile health (mHealth) intervention which has the potential to reach a large number of tobacco users. It provides support all the time anywhere, among different types of tobacco users and is also cost effective.[3] Interest in the application of technology to improve health behaviour has grown tremendously over the past decade due to the

* *Corresponding author*.
E-mail address: dranup.kharde@gmail.com (A. Kharde).

https://doi.org/10.18231/j.ijcaap.2023.028
2581-5555/© 2023 Author(s), Published by Innovative Publication.

exponential increase in mobile phone users in India.[4] India had 1.2 billion mobile subscribers in 2021, of which about 750 million are smartphone users.[5] Among the 483 million mobile users in India in 2018, 390 million users accessed the internet.[6]

The advances in mobile technology have made it possible to implement tobacco cessation interventions that were impossible in the past.[7] Mobile health (mHealth) solutions are emerging to improve smoking cessation treatment. Smoking cessation services internationally are using applications in mobile phones to deliver support, particularly as adjuncts to other services. Smart phone-based tobacco cessation apps can be used anytime at any place, which are accessible to a large number of people and at a low cost. It can suppress craving by distraction.[8] These apps can give real-time support which can be critical for relapse.[9]

The present study was focused on gaining the perception and review of the currently available tobacco cessation mobile applications by online and on-field surveys in Indian scenario.

2. Materials and Methods

The study was divided into 2 phases. The study was initiated after taking ethical approval.

In Phase I, the most commonly used tobacco cessation applications with the highest rating from Google Play Store were selected. The most relevant, positive and critical reviews of these apps were recorded. The reviews were categorized as Positive (Customer support, Tracking statistics, Reward System & Craving Management) and Negative (Lack of customer Support, User Friendly& Pushing for in-app Purchases).

In Phase II, tobacco users with smart phone & internet connectivity and ready to give verbal consent were included in the study. Tobacco users unable to read and understand basic English and those unable to use the app were excluded from the study. The same applications that were selected for phase I were allocated to the study participants. At first, interaction the application was installed in the participant's mobile phone and a quick to use session was held. The participants were asked to use the application on a regular basis. At the end of the 2nd week, the participants were subjected to a questionnaire for feedback about the application. The feedback was obtained for liked features, disliked features, most used features, frequency of app use, utility, expectations, and suggestions for app. The data thus obtained was recorded in an excel sheets and appropriate descriptive statistics were applied.

3. Results

3.1. Phase I

21 tobacco cessation apps were found on Google Play Store, of which 5 were selected based on more than 1 million downloads and a rating of 4.5+ stars. These were QuitNow (4.6 stars), Smoke Free (4.7 stars), Quit Tracker (4.8 stars), Stop Smoking – EasyQuit (4.7 stars) and Quit Smoking – SSC (Stop Smoking Counter, 4.2 stars).

Table 1 represents the positive response categories along with the number of reviews supporting that particular category.

Special features of the apps are displayed in Table 2.

Table 3 shows the critical reviews with respect to the apps.

3.2. Phase II

In phase II, 110 tobacco users were screened for the study. However, 70 [38 males + 32 females] users did not enrol for the study. Ninety seven (88.2%) were smokeless tobacco users, while 13 (11.8%) were bidi/cigarette users. The reasons for nonparticipation are depicted in Graph 1. Thus, 40 tobacco users were enrolled in the study. 8 study participants were allocated for each app.

Table 4 depicts the overall rating of the application by the study participants.

Tables 4 and 5 summarizes the feedback of study participants regarding the apps.

4. Discussion

In western countries, the mobile applications for tobacco cessation have shown no evidence of increased probability of smoking cessation.[10] However, most of the studies conducted on utility of mobile applications for tobacco cessation were pilot studies.[11] Therefore, there is a felt need for conduct of more well designed clinical studies with large sample sizes and including differenct user groups.[3,11,12]

The usage of the applications for tobacco cessation among low income groups, minority populations is meagre. Various individual and technical barriers need to be addressed for improving the use of these applications.[13]

Being a developing country, the usage of the tobacco cessation apps need to be customized for relevance of its use. Given the differences in culture and diversity of languages spoken, the present study was conducted to ascertain the suitability of these applications for Indian population.

4.1. Phase I

As shown in Table 1, the applications may be ranked for customer support, tracking statistics, reward system, and craving management based on the frequency of response. However, the responses were not uniform owing to a

Table 1: Positive Response categories along with the number of reviews supporting that particular category

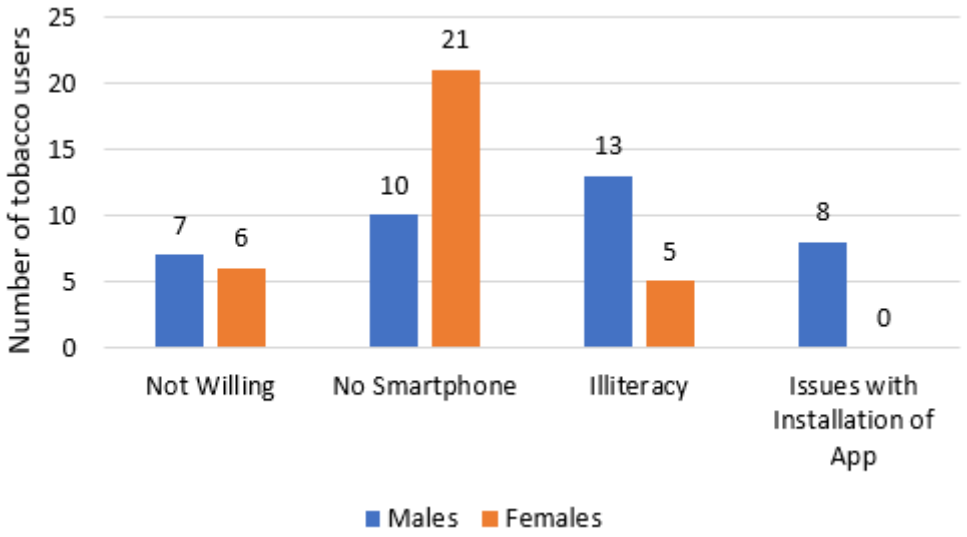
	No of reviews	Customer support	Tracking statistics	Reward system	Craving management	User friendly	Informative
Quit Now	97	3 (3%)	35 (36%)	7 (7.2%)	0		3 (3%)
Smoke Free	92	4 (4.3%)	38 (41.3%)	12 (13%)	13 (14.1%)		
Quit Tracker	92	0	53 (57.6%)	10 (10.8%)	20 (21.7%)	15 (16.3%)	
Easy Quit	95	1 (1.1%)	42 (44.2%)	10 (10.5%)	28 (29.4%)	6 (6.3%)	
Quit Smoking-SSC	17	0	7 (41.1%)	2 (11.7%)			5 (29.4%)

Table 2: Special features in each app with it's popularity

Application	No of reviews	Special features	
Quit Now	97	User Interface 2 (2.1%)	Chat room support 36 (37.1%)
Smoke Free	92	Social media sharing 2 (2.2%)	Quit coach (AI) 5 (5.4%)
Quit Tracker	92	Motivational quote 10 (10.9%)	
Easy Quit	95	Slow method 2 (2.1%)	

Table 3: Major complains of users after using the particular app

Application	No of reviews	Lack customer support	Less User Friendly	Pushing for in-app purchases	Community regulations	For specific countries
Quit Now	97	10 (10.3%)	11 (11.3%)	12 (12.4%)	11 (11.3%)	
Smoke Free	92	16 (17.4%)	14 (15.2%)	15 (16.3%)		
Quit Tracker	92	7 (7.6%)	3 (3.3%)	15 (16.3%)		
Easy Quit	95	5 (5.3%)	28 (29.5%)	8 (8.4%)		
Quit Smoking	17	2 (11.8%)		1 (5.9%)		5 (29.4%)



Graph 1: Reasons for dropout from screening

Table 4: eanapplication rating of tobacco cessation applications

App.	Stop Smoking-EasyQuit	Quit now	Quit tracker	Smoke free	Quit smoking SSC
Mean	8.4	9.1	8.1	9.0	7.4
Std. Dev	1.7	1.1	1.6	1.3	1.7

P = 0.1835, Kruskal-Wallis Test (Nonparametric ANOVA)

Table 5: eedback of study participants

	Easy Quit	Quit Now	Quit Tracker	Smoke Free	Stop Smoking
Liked Features					
Game	7	-	7	-	-
Time, Health and money tracking	6	7	3	7	7
Disliked features					
Pushing for in-app purchases (either in the form of Ads/upgrade to unlock all features)	6	5	6	3	6
Most used feature					
Game	4		4		
Tracking system	2	7	1	7	3
Daily Frequency of use of Application					
0	1		1	1	
0-1					3
1-2	2	5	5	6	4
2-3	2	3	2	1	1
3-4	3				
	Is App Helpful?				
Yes	6	7	5	6	3
No	2	1	3	2	5
Expectations from Tobacco cessation application					
Ads should not be there	4	1	2	1	
Craving management		5	1	3	5
Easy to use					1
Language (Marathi)	2	2	1	1	2
Game should be better	1				
Proper Time tracking feature			4		
Any suggestion					
Language		1			
Craving management Easy to use					1
Improve time tracker			1		
Remove Ads	6	4	4	1	4

voluntary open-ended feedback from the app users. Of these apps, positive feedback on all the above features were observed except for Customer support (Quit Tracker and Quit Smoking - SSC) and craving management (Quit Now and Quit Smoking SSC). Some features were unique to some apps like user friendliness (Quit Tracker and Stop Smoking-Easy Quit) and being Informative (Quit Smoking SSC and Quit Now). Moreover chat room support of Quit Now and motivation quotes by Quit Tracker was appreciated by users, respectively (Table 2). The unique feature of sharing progress on social media and the use of Artificial Intelligence not to talk users through cravings used by SmokeFree requires special mention, although which was a paid feature.

The problems faced by app users were categorized as lack of customer support, less user friendly, pushing for in-app purchases, community regulations, and designed for specific countries. All 5 apps were inefficient with respect to customer support, purchasing for in-app purchases (by advertisement or restricting features to ask the user to upgrade to the premium version), and less user friendly (except Quit Smoking). Community regulation (Quit Now) and designed for a specific countries (Quit Smoking), respectively, were additional drawbacks.

4.2. Phase II

In phase II, the eligible candidates refused/were not included in the study owing to refusal (15, 13.7%), unavailability of the smartphone (31, 28.2%), issues with installation of the app (8, 7.3%) or illiteracy (18, 16.4%). Although most of the tobacco users screened in the study used smokeless tobacco (88.2%), all apps that were available were designed for smokers. According to Rani M Etal, the use of smokeless tobacco is more common in rural population.[14] Thus, tailoring apps for smokeless tobacco is an important requirement for Indian population.

There was no significant difference in the mean rating of the apps (on the scale of 1 to 10) when compared among each other (P = 0.1835, Kruskal-Wallis Test). The apps compared were selected on the basis of their usage and rating. Hence, the rating may be comparable.

The feedback of the apps is summarized in Tables 4 and 5 and discussed individually below:

Stop Smoking - EasyQuit has a quit smoking slow mode, scientific health statistics, money saved, motivational badges, and many more features. It also has a user-friendly interface along with a simple Flip-card memory game which is the most liked as well as the most used feature among the participants. Due to these features, it is the only app which participants used more frequently. However, Ads was the most disliked feature and suggested for removal, which kept the users away from using the app. The expectations from the apps were the use of local language and improvement in gaming features.

The most liked and used features of QuitNow were tracking progress in terms of time since quit, money saved, and health improved. Study participants used the app at least 1-2 times in a day. Pushing to upgrade to premium versions and ads were the most disliked features. The expectations from the app were provision for craving management, Ad free, and availability in local language (Marathi).

The in-app craving management game and money saved features of Quit Tracker were the most liked and frequently used features. Study participants used the app at least 1-2 times in a day. The disliked features were ads and format of time since quit. Removal of ads, proper time tracking feature, and use of local language were the expectations of participants.

Tracking the progress in terms of time since left, money saved and health improved was the most liked and the most used feature of Smoke Free. Most participants used the app for at least 1-2 times a day. Pay to unlock feature was disliked by the participants. Provision of craving management, free app, and options for language were the expectation of the app.

Quit Smoking- SSC had the most liked features as tracking progress in terms of time since quit, money saved, life regained. Most participants used the app for at least 1-2 times a day. The disliked feature was frequently displayed ads. Provision of craving management, availability in local language, and Ad free & more user-friendly apps were the expectations of the study participants.

Being a study of its own kind, no comparative studies could be found. In a systematic review conducted by Bold etal, mobile applications available for tobacco cessation were studied for the relevance, functioning and ratings. Out of 389 applications they could only find 12 applications which had evidence of efficacy for cessation of tobacco. The other issues with the applications were cost and high rate of turn over. It was felt that the comprehensive evaluation of these apps was necessary.[15] The present study supports the findings by Bold.

To summarize, the apps were lacking a support systems for craving management and were pushing for in-app purchases. On the contrary, tracking progress, gaming features or tips for craving management as well as reward system were the liked features of the apps. Each app also had some unique features which were appreciated.

Apart from the findings of the study, a thorough search for tobacco cessation apps revealed that these apps do not provide features for smokeless tobacco cessation, local language, or comprehensive approach towards cessation like guidance for personalized counselling and treatment.

The present study thus provides an opportunity to look into the pros and cons of commonly favoured apps and provides an insight for the improvement of the apps. A comprehensive approach to amalgamation of all positive features and mitigation of unwanted/disliked features may prove the development of a better version of app.

5. Conclusion

Our research compared and analysed few of the most used tobacco cessation applications used by millions of users but still could not find an ideal tool to deliver the aid for tobacco cessation through the mHealth approach. With all pros (like tracking progress and craving game) and cons (like advertisements, lack provision of local language & options for smokeless tobacco), a more comprehensive approach should be taken in developing a tobacco cessation application so that it could help the tobacco users in a better way. Use of unique features of the apps like customer support, sharing on social media, chat room support, and artificial intelligence but may prove helpful for increasing compliance. Approaches should be taken to understand more of the user's perspective and expectations rather than seeing it as a commercial opportunity.

6. Conflict of Interest

None

7. Source of Funding

None.

8. Acknowledgement

Management and Administration of Pravara Medical Trust, Loni

References

1. Global-Adult-Tobacco-Survey-Second-Round-India-2016-2017. [Internet]. [cited 2023 Sep 18]. Available from: https://ntcp.mohfw.gov.in/assets/document/surveys-reports-publications/Global-Adult-Tobacco-Survey-Second-Round-India-2016-2017.pdf.
2. Tobacco [Internet]. [cited 2023 Sep 18]. Available from: https://www.who.int/india/health-topics/tobacco.
3. Cobos-Campos R, De Lafuente A, Apiñaniz A, Parraza N, Llanos IP, Orive G, et al. Effectiveness of mobile applications to quit smoking: Systematic review and meta-analysis. *Tob Prev Cessat*. 2020;6:62. doi:10.18332/tpc/127770.
4. Free C, Phillips G, Galli L, Watson L, Felix L, Edwards P, et al. The effectiveness of mobile-health technology-based health behaviour change or disease management interventions for health care consumers: a systematic review. *PLoS Med*. 2013;10(1):1001362. doi:10.1371/journal.pmed.1001362.

5. India to have 1 billion smartphone users by 2026: Deloitte report [Internet]. [cited 2023 Sep 18]. Available from: https://www.business-standard.com/article/current-affairs/india-to-have-1-billion-smartphone-users-by-2026-deloitte-report-122022200996_1.html.
6. Statista [Internet]. [cited 2023 Sep 18]. Available from: https://www.statista.com/statistics/558610/number-of-mobile-internet-user-in-india/.
7. McClernon FJ, Choudhury RR. I Am Your Smartphone, and I Know You Are About to Smoke: The Application of Mobile Sensing and Computing Approaches to Smoking Research and Treatment. *Nicotine Tob Res*. 2013;15(10):1651–4. [cited 2023 Sep 18].
8. Carrasco-Hernandez L, Jódar-Sánchez F, Núñez-Benjumea F, Conde JM, González MM, Civit-Balcells A, et al. A Mobile Health Solution Complementing Psychopharmacology-Supported Smoking Cessation: Randomized Controlled Trial. *JMIR Mhealth Uhealth*. 2020;8(4):e17530. doi:10.2196/17530.
9. Etter JF, Khazaal Y. The Stop-Tabac smartphone application for smoking cessation: study protocol for a randomized controlled trial in the general population. *Trials*. 2020;21(1):449. doi:10.1186/s13063-020-04377-0.
10. Whittaker R, Mcrobbie H, Bullen C, Rodgers A, Gu Y, Dobson R, et al. Mobile phone text messaging and app-based interventions for smoking cessation. *Cochrane Database Syst Rev*. 2019;10(10):CD006611. [cited 2023 Sep 18]. doi:10.1002/14651858.CD006611.
11. Chu KH, Matheny SJ, Escobar-Viera CG, Wessel C, Notier AE, Davis EM, et al. Smartphone health apps for tobacco Cessation: A systematic review. *Addict Behav*. 2021;112:106616. doi:10.1016/j.addbeh.2020.106616.
12. Regmi K, Kassim N, Ahmad N, Tuah NA. Effectiveness of Mobile Apps for Smoking Cessation: A Review. *Tob Prev Cessat*. 2017;3:12. doi:10.18332/tpc/70088.
13. Lepore SJ, Collins BN, Killam HW, Barry B. Supportive Accountability and Mobile App Use in a Tobacco Control Intervention Targeting Low-Income Minority Mothers Who Smoke: Observational Study. *JMIR MHealth UHealth*. 2021;9(7):e28175. doi:10.2196/28175.
14. Rani M, Bonu S, Jha P, Nguyen SN, Jamjoum L. Tobacco use in India: prevalence and predictors of smoking and chewing in a national cross sectional household survey. *Tob Control*. 2003;12(4):e4. doi:10.1136/tc.12.4.e4.
15. Bold KW, Garrison KA, Delucia A, Horvath M, Nguyen M, Camacho E, et al. Smartphone Apps for Smoking Cessation: Systematic Framework for App Review and Analysis. *J Med Internet Res*. 2023;25:e45183. doi:10.2196/45183.

Author biography

Shashwat Jaiswal, Student

Sandeep Narwane, Professor

Rahul Kunkulol, Professor & Head

Anup Kharde, Associate Professor https://orcid.org/0000-0002-3073-4529

Motilal Tayade, Professor

Cite this article: Jaiswal S, Narwane S, Kunkulol R, Kharde A, Tayade M. Comparison of utility of tobacco cessation mobile applications with regard to Indian scenario. *IP Int J Comprehensive Adv Pharmacol* 2023;8(3):165-170.