Journeyfy: An Android-Based Mobile Application Utilizing Persuasive Technology for Assisting in Vice Cessation

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Abstract—This study explores the untapped potential of persuasive technology and its effectiveness in cessation by implementing persuasion or motivational techniques. Incorporated extrinsic and intrinsic methods help users improve their chances of cessation by providing a tangible means to measure their progress while being constantly encouraged by the application. The purpose of the application, Journeyfy, is to be a companion app partnered with guided therapy from a professional. The study aims to measure the effectiveness of the application as well as its usability. This study uses qualitative and quantitative methods, particularly a descriptive and experimental method for the quantitative approach and thematic analysis for the qualitative approach. The findings are positive; Journeyfy application received an excellent rating and an average of 0.68 standard deviations on its usability testing. The study received good usability feedback from the participants and the partnered psychometrician. The Journeyfy application exhibited that persuasive technology positively affects the design of a vice cessation assistant application and achieves the desired result of the objectives and, therefore, is a functional application that satisfies the needs of the researchers.

Index Terms—persuasive technology, mobile application, android, vice cessation, psychology, journal entry

I. INTRODUCTION

Electronic health (E-health) is the use of Information and Communications Technologies (ICT) as an avenue to improve health services access, efficiency, and quality [1]. E-health is said to have the potential to facilitate disease control, especially in the case of treatment to asthmatic patients [2]. It also influences people's health behavior, and the need for intervention using e-health will increase [3]. There is currently a trend wherein there is a significant shift from traditional technology towards mobile-based technologies such as mobile phones. Given this, almost all students already possess a mobile phone, wherein more than half of them own more than one phone [4]. Mobile applications, where Android is the dominant platform, also play a role in electronic therapy (e-therapy), which would assist in counseling in the academic context [5], [6]. The use of journals helps

people record experiences. It aids in improving social skills, especially among children. Lara's study [7] stated that reflective journaling increases writing participation and develops into a coping mechanism. A method for dealing with issues is through psychotherapy. It is a method of using psychological means instead of medical to approach a mental disorder. Trials regarding positive psychotherapy for smoking cessation were already conducted, and although the effect is not as significant, it has the potential in smoking cessation interventions [8]. Although presented with the adverse effects of tobacco consumption, many people still are persistent in using tobacco. Aside from tobacco use, alcoholism is also one of the world's prevailing vices.

A solution that addresses vice cessation would be appropriate under the application development subject matter. In line with this, the researchers consider developing an application that would help smokers and alcoholics in the cessation intervention process while incorporating counseling is a feasible solution, especially during the pandemic wherein the use of such substances is escalated [9], [10]. A system can then tailor new information for the user to see, such as a comparative price to the total money they saved or even a growth in progress.

In this study, the addition of index repeating is used to improve the analysis of information further. Index repeating measures a user's changes by comparing an initial input to a more recent one. A system can then tailor new details for the user to see, such as a comparative price to the total money they saved or even a growth in progress [11].

This study aims to answer the question, "How does persuasion technology, through the use of journal-styled milestones and index-repeating features, affect the design of an interactive mobile application used for assisting in the vice cessation of an individual?"

A. Objective of the Study

The study aims to develop an Android-based mobile application that will assist a user in their vice cessation. Specifically, this study intends to achieve the following: 1. Develop an Android mobile application compared to a traditional "pamphlet" drive survey questionnaire to measure thematic testing; 2. Design a content management system and database that accepts user login,

journal or diary manual entry, daily check-in, and maintenance of the app; 3. Provide an online community that implements a leader-group system, with a psychologist as the counselor and leader.

B. Scope and Delimitation

The study focuses on an Android application called Journeyfy, which tracks the daily consumption of the users with their vices. The experiment runs for a month at minimum, and a questionnaire asks if the situation has improved in randomized testing. The system's design was based on the suggestions of licensed psychologists. User achievements are set in the mobile application to encourage users to by obtaining trophies. The respondents of this study are from adolescence to adult or 18 years old above and 60 years old below). The user of the system are the system administrator, psychologists or counselors that acts as leaders, and those with smoking vices.

II. REVIEW OF RELATED LITERATURE

Study shows that interactive mobile applications are 25.5% more effective than an informative application that is only 16.9%, by having a quasi-experimental examination. Furthermore, it indicates that interactive applications can increase the probability of smoking cessation [12].

A psychopharmacological therapy for smoking cessation by Carrasco-Hernandez *et al.* (2020) analyzed the efficiency of the mobile solution when it comes to a long-term answer to smoking cessation. The method used in the study is a trial wherein the participants are divided into two groups randomly, and one group is given only psychopharmacological therapy for their cessation process. In contrast, the other groups were psychopharmacological therapy and mobile application. The intervention provided support messages tailored for smoking cessation. The results stated that the group who received both the treatment and the mobile application has a higher abstinence rate, particularly 2.75 times higher in the per-protocol analysis and 2.15 times higher in the intention-to-treat study. In conclusion, the mobile application in the cessation process exhibited improvement compared to only receiving the therapy [13].

Android platform has various purposes, from home automation using Internet-of-Things [14] to developing deep neural network techniques for health [15]. It also includes the use of Android systems in education [16], [17] and combined with other technologies like e-farming persuasive system [18]. Studies on different interventions for cessation have varied results. It can increase abstinence and, at the same time, lessens the users' cravings for using substances considered as vices. The study shows that interaction-based app is more effective for cessation than a traditional pamphlet-based campaign, and psychotherapy is beneficial in cessation intervention.

III. METHODOLOGY

This study used a qualitative and quantitative method using the prerequisite, and the survey questionnaire gathered. The descriptive and experimental methods for the quantitative approach and thematic analysis for the qualitative method [19] were based from the use of the developed Android application, Journeyfy.

A. Gathering of Data and Analysis

In the first phase of the development, the study reviewed works of literature on persuasive technology. The developed application focused on usability, basic ergonomics, user interface design, and a low entry ceiling to easily access the application.

B. System Design

In the second phase of the development, the study identified the features of the system. Journeyfy uses index repeating and a journal feature, and a chat system to connect to a supportive community if the user has access to the internet. Journey also features various tools to track its users' progress, such as money saved, time without any vice use, popups with supporting messages, and a database on how to stay healthy and away from the said vice. Index repeating is a method derived from the difference of one index to another by enabling future broadcasts like how many days it will take to achieve x amount of money saved. Also, Journeyfy logs its users' milestones and compiles them into a timeline showing their progress. The conceptual framework of the study is shown in Fig. 1.
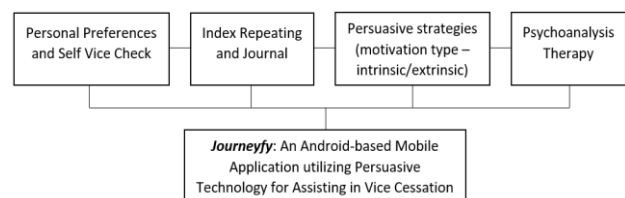

Figure 1.   Conceptual framework of Journeyfy mobile app.

The developed system included motivational messages, which are personalized smoking cessation texts sent as an encouragement to smoking abstinence. The design of this study contains user profiles and smoking-related activities such as quitting date, physical activity time, savings, number of non-smoked cigarettes, and smoke-free days. This feature is the same as with paper-based leaflets or mini-magazines applied to mobile systems [20]. Mandatory information about quitting options, benefits and harms, daily motivational messages, a quitting diary, and a quitting benefits tracker are also part of Journeyfy [21]. The intrinsic motivation of persuasion technique contributes to the users' inner satisfaction or motivation, such as doing an enjoyable activity that one may feel happy towards quitting smoking. At the same time, extrinsic motivation for rewards serves as encouragement [22].

The mobile application also contains cards that display data gathered from the user's daily logs. This page includes the number of days the user has undergone vice cessation, the total money saved, vice not used, the number of hours the user has avoided a vice, number of journal entries, and number of achievements. All the main screens of the application (achievements, chat,

homepage, statistics, and journal) contain a navigation bar as shown in Fig. 2. This feature gives users of the application convenience when switching to different screens. Convenience is one of the principles of persuasive technology [23]. Journeyfy sends notifications to send motivational quotes to the user, remind the user to daily input logs, or inform the user that a specific achievement is unlocked. The user's notification panel will then display the notification.
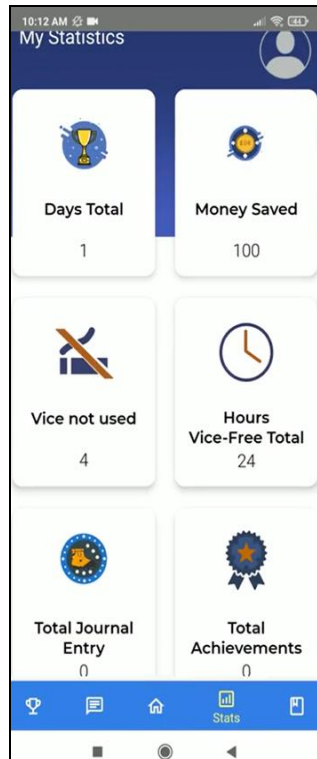

Figure 2. Journeyfy app preferences navigation screen.

C. Implementation

In this phase, developing and implementing the ascertained features of the application are further enhanced and integrated. The study used Android Studio to code the mobile application and Firebase for database. The persuasive technology in the Journeyfy mobile application includes the motivational type, wherein the application uses both intrinsic and extrinsic motivation. The reinforcement type of persuasive technology is also shown in Table I.

TABLE I. JOURNEYFY'S PERSUASION TECHNOLOGY TYPE

Mobile Application Feature	Motivation Type	Reinforcement Type
Vice Input Daily Check-In	Intrinsic	Positive and Negative
Statistics	Extrinsic	Positive
Journal Input	Intrinsic	Positive
Achievements	Extrinsic	Positive
Automated Journal	Extrinsic	Positive
Comparative Prices	Extrinsic	Positive
Notifications	Extrinsic	Positive

D. Testing

The various types of users of the developed system include information technology practitioners, smokers, psychometricians, and ordinary users. A total of thirty (30) respondents was involved in the usability review using Nielsen's Heuristics and revised to fit the app accordingly. Survey questionnaires were given out randomly to the chosen respondents ages 18 to 60 in a purposive sampling.

The sign-up page of the application profiled the users of Journeyfy, which consists of age, vice usage frequency, and the typical cost of procuring the said vice. After a month, the users took a survey which consisted of how active they use the application and how frequent they use their said vice, and their perception towards ergonomics and usability of the application.

The Modified Hooked on Nicotine Checklist (HONC) is the sign-up questionnaire used, and the psychotherapist issued a progress report to the users after one month of use. The Likert scale is used to measure perception towards the Journeyfy mobile application. The study utilized the one-sample t-test to compare two independent groups to determine the average of one group against the set average.

IV. RESULTS AND DISCUSSION

A. Usability Review

The usability review questions are based on Jakob Nielsen's Heuristics, which includes visibility of system status, the match between the system and the real world, user control and freedom, consistency and standards, error prevention, recognition rather than recall, flexibility, and efficiency of use, aesthetic and minimalist design, help users recognize, diagnose and recover from errors and help and documentation [24]. The respondents of the usability survey questionnaire are thirty (30) respondents ages 18-60 comprised of nine sections, namely: Features and Functionality, Homepage or Starting Page, Navigation, Notifications, Control and Feedback, Forms, Content and Text, Side Menu Content, and Performance. Each question was answered through a Likert scale, with the following choices: 1 = Very Poor, 2 = Poor, 3 = Moderate, 4 = Good, and 5 = Excellent. The mean and standard deviation identified the average scores. Each mean score is categorized based on the choices provided by each question. Suppose the standard deviation is near 0.0 or spread if the standard deviation is near 1.0, which means it is clustered, as shown in Table II. The features and functionalities of the application were able to meet the user's goals and objectives, and support the desired workflow. In addition, Journeyfy also provides accessibility wherein the most-used features can easily be located through its placement on the screen and that each of these features is well-supported.

The Journeyfy's homepage is considered aesthetically pleasing. Its gamified features provided a practical design in motivating vice users [25] through its clear overview and snapshot of the content, features, and functionalities. Furthermore, the application's orientation and guidance through the homepage direct the users to their desired

tasks. The parts are easily accessible, as shown in Table III homepage usability results. The navigation design provides convenience for the users with its good placement, proper application structure, clear and well-labeled text, and appropriate highlights. The users can easily know where they currently are while navigating the app, as shown in Table IV.

TABLE II. JOURNEYFY'S FEATURES AND FUNCTIONALITY

Questions	Mean	Standard Deviation
Meet the intended common user goals and objectives.	4.367	.7184
Support users desired workflows.	4.233	.6789
Frequently-used features can be easily accessed.	4.167	.7915
How much effort did you personally have to put forth to handle your request?	2.933	1.3880
Call to action buttons are clear, well-labeled, and appear clickable.	4.367	.6687

TABLE III. JOURNEYFY'S HOMEPAGE USABILITY RESULT

Questions	Mean	Standard Deviation
Provides a clear snapshot and overview of the content, features, and functionality available.	4.000	.8710
Effective in orienting and directing users to their desired information and tasks.	3.967	.8899
Frequently used tasks are readily available	4.367	.6687
Page layout is aesthetically pleasing and has a gamified design.	3.800	.9248
Provides a clear snapshot and overview of the content, features, and functionality available.	4.000	.8710

TABLE IV. JOURNEYFY'S NAVIGATION USABILITY RESULT

Questions	Mean	Standard Deviation
Users can easily navigate through other pages.	4.767	.4302
The navigation menu is easy to find and has good placement.	4.733	.4498
The navigation menu provides convenience to the users to navigate to their desired tabs.	4.600	.5632
The site or application structure is clear, easily understood, and addresses common user goals.	4.400	.8137
Links and texts are clear, descriptive, and well labeled.	4.300	.6513
Application standard functions (e.g. 'back') are supported.	4.400	.7701
The current location of the user in the application is indicated.	4.600	.6215
Users can easily get back to the homepage or a relevant start point.	4.533	.6814
A clear and well-structured index or site map is provided where it is needed (header or footer navigation bar is present on major pages).	4.433	.6789

The notifications are one of the Journeyfy's main features, such as motivational messages and alerting users of their achievements. Usability results show that notifications are helpful because of its readability and proper execution, which remind the participants about the system's information, as indicated in Table V.

Appropriateness of feedback is considered crucial for encountered issues within the application for a better experience [20]. The usability result shows that respondents considered Journeyfy's feedback and control appropriate and working properly. A successful action follows the error handling and prompts, as shown in Table VI.

TABLE V. JOURNEYFY'S NOTIFICATIONS USABILITY RESULT

Questions	Mean	Standard Deviation
Notifications provided by the app are readable.	4.800	.4068
Notifications are properly executed when prompted.	4.567	.8584
The notifications provide the correct and accurate information when displayed to the user.	4.600	.6687
Notifications are not out-of-place (e.g. when a user visits the achievements tab, the notifications about the achievements are displayed).	4.400	.4498

TABLE VI. JOURNEYFY'S CONTROL AND FEEDBACK RESULT

Questions	Mean	Standard Deviation
Prompt and appropriate feedback is given following a successful or unsuccessful action.	4.700	.5350
Users can easily undo, go back and change or cancel actions; or are at least given the chance to confirm an action before committing.	4.600	.6747
Proper information is displayed after every successful action by the user.	4.800	.4068

Designing forms in mobile applications isn't easy because forms are considered a means to an end. They are considered one of the most critical user interactions in mobile applications and other web applications [19]. In line with this, Journeyfy displayed well-designed forms with minimal information and a clear justification for this information. Complex forms were also easily understood by the users, and the fields displayed by the system contained the appropriate input, as indicated in the usability result in Table VII.

TABLE VII. JOURNEYFY'S FORMS RESULT

Questions	Mean	Standard Deviation
Complex forms and processes are broken up into readily understood steps and sections such as filling titles and descriptions while adding journals. Progress indicators are present with clear numbers or named stages.	4.633	.5561
A minimal amount of information is requested and when required reasonable justification is indicated when asking for information (e.g. age, email).	4.567	.6261
Required and optional form fields are indicated.	4.567	.6789
Appropriate input fields (e.g. calendar for date selection, drop down for selection) are used and required formats are indicated.	4.233	.8976
Instructions (e.g. examples, information required) are indicated where necessary.	4.500	.7768

Content and text in an application make the application a working product. Information that the developers want to convey can be easily done with content and text, and with proper design, it could make a good impact on the user's experience [20]. In line with this, Journeyfy contains content and text that is consistent, relevant, legible, and scannable. The terms, language, and tone used are also consistent, and overall, the content and text of the app contain good typography and visual contrast as shown in usability result Table VIII.

TABLE VIII.   JOURNEYFY'S CONTENT AND TEXT RESULT

Questions	Mean	Standard Deviation
The content available (e.g. text, images) is appropriate and sufficiently relevant, and detailed to meet user goals.	4.633	.5561
Links to other useful and relevant content (e.g. related pages or external websites) are available and shown in context properly.	4.567	.6261
Language, terminology, and tone used are appropriate and readily understood by the target audience.	4.567	.6789
The terms, language and tone used is consistent (e.g. the same term is used throughout).	4.233	.8976
Text and content are legible and scannable, with good typography and visual contrast.	4.500	.7768

The Side Menu of the Journeyfy application is an important feature as it displays some of the essential designs. Side menu that displays inappropriate content could be detrimental for the user, especially for their navigation experience. In line with the side menu usability result, respondents find it very helpful and reliable. The Journeyfy's auto journal tab provides an accurate timeline to the user's vice usage. The comparative (compare their saved money to relatively useful materials) price tab feature is beneficial. Also, the contact tab displayed the correct information to the users for their convenience, as shown in Table IX.

Proper application performance for a developed mobile application is a must design. The usability result of Journeyfy indicated a responsive and reliable design essential for user experience. Overall, the Journeyfy application is proper-performing by the users' standards, as shown in Table X.

TABLE IX.   JOURNEYFY'S SIDE MENU CONTENT RESULT

Questions	Mean	Standard Deviation
The Auto Journal tab provides accurate information with regards to the user's timeline and usage of vice.	4.433	.9353
The Comparative Price tab provides relatively helpful prices compared with the user's saved money.	4.667	.5467
The About Tab provides an accurate description of the app and its developers.	4.733	.5833
The Contact Tab provides the developer's contact and information, as well as the partner psychometrician.	4.900	.3051

TABLE X.   JOURNEYFY'S PERFORMANCE RESULT

Questions	Mean	Standard Deviation
Site or application performance does not inhibit the user experience (e.g. no long response time).	4.100	.9595
Errors and reliability issues don't inhibit the user experience (free of bugs and broken links).	4.367	.8087
Possible user configurations (e.g. screen resolutions) are supported.	3.933	1.0148

V.   THEMATIC ANALYSIS

The results gathered from the one-month-long vice-cessation therapy present the participants' experience with Journeyfy. According to the study of Fugard and Potts [26], thematic analysis can have two (2) to four hundred (400) participants. This thematic analysis would imply that the data with three (3) participants is acceptable and valid.

A.   *Frequency of Vice Consumption, Contributing Factors, and Coping Mechanisms*

Participant 1 consumes the most number of vices (fifteen cigarettes per day). The partner psychometrician noted that personal stress was also an issue that correlates with their smoking behavior -- *they smoke more due to stress*. Participant 1 reads books, runs in the morning and watches a series of movies just to lessen the cravings. Participant 2 only smokes three (3) times a day. The participant's progress report stated that *"the reason they smoke more is when they are stressed especially with school work and examinations. According to them, they feel calmer when they do that"*.

Furthermore, Participant 2 enrolled in a gym due to their interest in losing weight. Participant 3 is a different case. The participant has been addicted to nicotine but was able to avoid it by using a vape. However, participant 3 has become reliant on it. The progress report indicated that: *"the vape is like a part of his body that they grab from time to time and without even counting how many "puffs" they had in a day"*. The study of Baumeister [21] stated that cigarette cravings are frequent and feel somewhat pleasant along the process. However, should the person desire to quit, the craving continues. The study of Khurshid *et al.* [22] confirms that Pakistani college students smoke due to peers and continues to do so for fun, stress-relieving, and relaxation [22], which can be observed similarly in the participants.

B.   *Vice Monitoring*

All three (3) participants agreed that monitoring the usage of their vices is beneficial to the vice cessation process. The counselor reported that for Participant 1, *"The application was a huge help to them and stated that they are being reminded with their cigarette intake and control themselves"*. Participant 2 mentioned that the vice monitoring feature of the *application "reminded them that they should follow the regimen agreed with the counselor"*. Lastly, Participant 3 said that *"an application that monitors their vape smoking is beneficial to them to monitor their vice cessation progress"*. Those

findings confirmed the study of McClure *et al.* [23], stating that remote monitoring applications for smokers are feasible in detecting smoking, and abstinence is stepping forward to bettering cessation strategies. With this, the study stresses out that both user experience and personalization are essential. The result of this study is also similar Wu *et al.* [24], where pregnant smokers used a vice cessation support application Journeyfy's personalization design, preferences with the vice checklist and comparative pricing, contributed to this factor.

C. Perspective on Application

Participant 1 noted that the application is more like a friend and a diary, serving as a reminder that the participant is going through vice cessation. This was pointed out in the his statement: *"Journeyfy is like a friend and a diary, a companion or tool accountable with vice cessation journey. It helps me keep going."* Participant 2 added that, *"Journeyfy also boost up discipline rather than self-motivation solely. Reminders act as a calendar or a logbook for progress monitoring".* Lastly, Participant 3 also expressed that Journeyfy is a companion app effective, with the use of pop-up messages as a reminder. He stated that *s*. In the study of Whittaker *et al.* [25], they concluded that there is moderate-certainty evidence that smoking cessation interventions utilizing automated text messages resulted in more excellent quit rates than minimal smoking cessation support. In the case of the Journeyfy system, applied notifications.

Moreover, in her study, Lara [8] mentioned that reflective journaling increases writing participation and develops a coping mechanism that helps prevent behavioral outbursts. In a similar study, Ali *et al.* [26] developed a mobile health application where it examined its acceptability among Pakistani smokers using the technology acceptance model. The participants of the study agreed to use this mHealth application, further saying that it is useful and easy to use [26].

D. Usage Trend and Cessation Progress

Participant 1 had good progress throughout the whole vice cessation process. In the last session, the participant figured out ways to manage their vice usage without therapy and monitor the application's number of days. Furthermore, the counselor noted that *"From the first session, about a month ago, I, as his counselor, can say that they improved a lot and they are serious about quitting cigarette smoking gradually and safely. On the other hand, Participant 1 managed their own decisions and initiated ideas that they would be profiting in the end. Lastly, they know now how to analyze the different scenarios why they took more sticks, the reason, and how they will manage to lessen their intake when that situation occurs again".* In the case of Participant 2, he exhibited signs of progress in the second session. The counselor reported that *"I expected that he would take more sticks than usual, but to my surprise, he was able to manage the stress without exceeding their usual stick of cigarettes per day".* The counselor believes that with the

current progress and continued use of the application, Participant 2 will reach zero nicotine consumption in about a month or two. Participant 3, having a different case, had good progress in the second session. Since the participant uses vape, observation is the number of days before the participant entirely consumes their vape juice. The counselor noted that *"he was able to last a juice with 9mg nicotine content for 8-10 days. Since the juice only lasts for five days before, I salute them for doing their duties that they can only smoke when their craving arises."* However, in the last session, participant 3 only maintained the 9mg nicotine content instead of lowering it to 6 per the counselor's advice. Therefore, the counselor still sees willingness in the participant for vice cessation. Furthermore, the counselor also reported that the participant said that *"an application that monitors their vape smoking will be beneficial to them so they can directly base his progress from there."*

In summary, the Journeyfy mobile application has helped remind users about undergoing vice cessation and being an overall companion in the whole process. The application's two participants had positive feedback on how the application aided and reminded them to avoid their vices and provide numbers relating to their vices (total vices not used, money saved, etc.). The counselor also noted progress among the participants using the application. Participant 3, who partially used the application, had steady progress. Furthermore, both the counselor and the participants agreed that using the application to monitor vice usage would be beneficial. The thematic analysis confirms the study of Carrasco-Hernandez *et al.* [13], wherein the mobile health solution paired with psychopharmacological therapy, exhibited greater efficacy than just having therapy alone. This finding is also reinforced by the study of BinDhim *et al.* [12]. It concluded that an interactive decision support mobile application increases the chance of smoking cessation rather than having informational pamphlets. Lastly, this successful result is also shown in the mindfulness training integrated into the mobile device in the study of Garrison *et al.* [27]. Journeyfy and Garrison's both regularly monitor the intake of cigarettes and how much the users smoke a day. This application feature then led to a positive impact on vice cessation and lessened cravings.

VI. CONCLUSION

Trends that deviate from the traditional norms have been rising lately, opening avenues towards new approaches to old problems. The design of persuasive technology is to change attitudes or behavior and proven helpful to many areas of expertise, one of which is therapy and cessation. The increase in the global economic cost of smoking-attributable diseases puts a major strain on any country, which makes up a significant percentage of 5.7% of the global health expenditures [9]. Availability and ease of access to mobile phones present a golden opportunity to present other methods to lower this strain; one of these is Journeyfy.

The purpose of the application Journeyfy is to be a companion app that integrates persuasive technology to support and guide users in their journey to cessation. Journeyfy aims to be a companion application meant to be paired with professional help, not a stand-alone product. The study measures the effectiveness of persuasive technology in place of cessation and the overall usability of the application. The developed application Journeyfy was split into two testing phases: a usability review composed of thirty (30) participants and a licensed psychometrician therapy session, which equips two of the three participants with the Journeyfy app to measure if the application has a conclusive use in a real-world scenario. The testing for the therapy lasted for a month, with three sessions for all 3 participants. Monitoring of average daily vice use tracking and money saved from the vice mitigation are its main functions. The application has features that utilize persuasive technology and index-repeating tools and journal milestones to help remind, motivate, and encourage users to their journey to cessation.

The finding was proven to be positive; Journeyfy received an 89 or excellent rating and an average of 0.68 standard deviations, or the dispersion of grading between participants on its usability testing. Theraphy participants gave positive feedback, as well as the partnered psychometrician. Journeyfy's effectiveness in being a companion mobile application that utilizes persuasive technology for cessation was received positively. The psychometrician also noted a visible decrease in average usage of vices on all the participants. In one case, the participant also managed to stay nicotine-free for a few days.

The persuasive techniques used in the Journeyfy application mainly revolve around the usage of motivational persuasion, specifically both extrinsic and intrinsic methods in the form of notifications. Journal features for the participant to write their thoughts down and provide a means to look back through time and view the progress of their thoughts and motivation. An achievement system to reward its user with a tangible badge. As a comparative approach that suggests to users what they can buy with the money they have saved from their cessation, some users may view that only a piece of cigarette is Php7 pesos and is therefore cheap. Still, it adds up as proven by one of the participants who saved more than Php700 pesos in a month. These features are built-in in the Journeyfy application to effectively remind its user of its progress and how significant and impactful their progress is; no matter how small or early, it can be a step towards cessation.

As for the effectiveness of index-styled milestones, achievements and features, the participants became more aware of their vice usages. One participant during the exit interview stated that *"Companion apps are effective pop-up reminders. You will see your progress and updates as you go along with the therapy process."* The application uses a content management system such as Firebase and Jet Admin to store, record, and calculate the users' progress.

The developed Journeyfy application met all the requirements of the study. The study addressed the research question as to how persuasive technology positively affected the design of an application that acts as an assistant to vice cessation. It was also able to achieve the desired result of the general and specific objectives following the set scope and delimitation of the study. Therefore, the produced application Journey is a functional application that satisfies the needs of the researchers to conduct the necessary steps to gather results. Furthermore, this study shows the possibility of companion applications boosting the effectiveness of guided cessation and the opportunity of a self-driven one.

CONFLICT OF INTEREST

AUTHOR CONTRIBUTIONS

Ms. Samonte supervised the whole research development and took the lead in writing the manuscript. Mr. Gonzales developed the theoretical formalism and wrote the manuscript with support from Mr. Fandiño and Mr. Pono. All authors provided critical feedback and helped shape the research, analysis, and manuscript.

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