



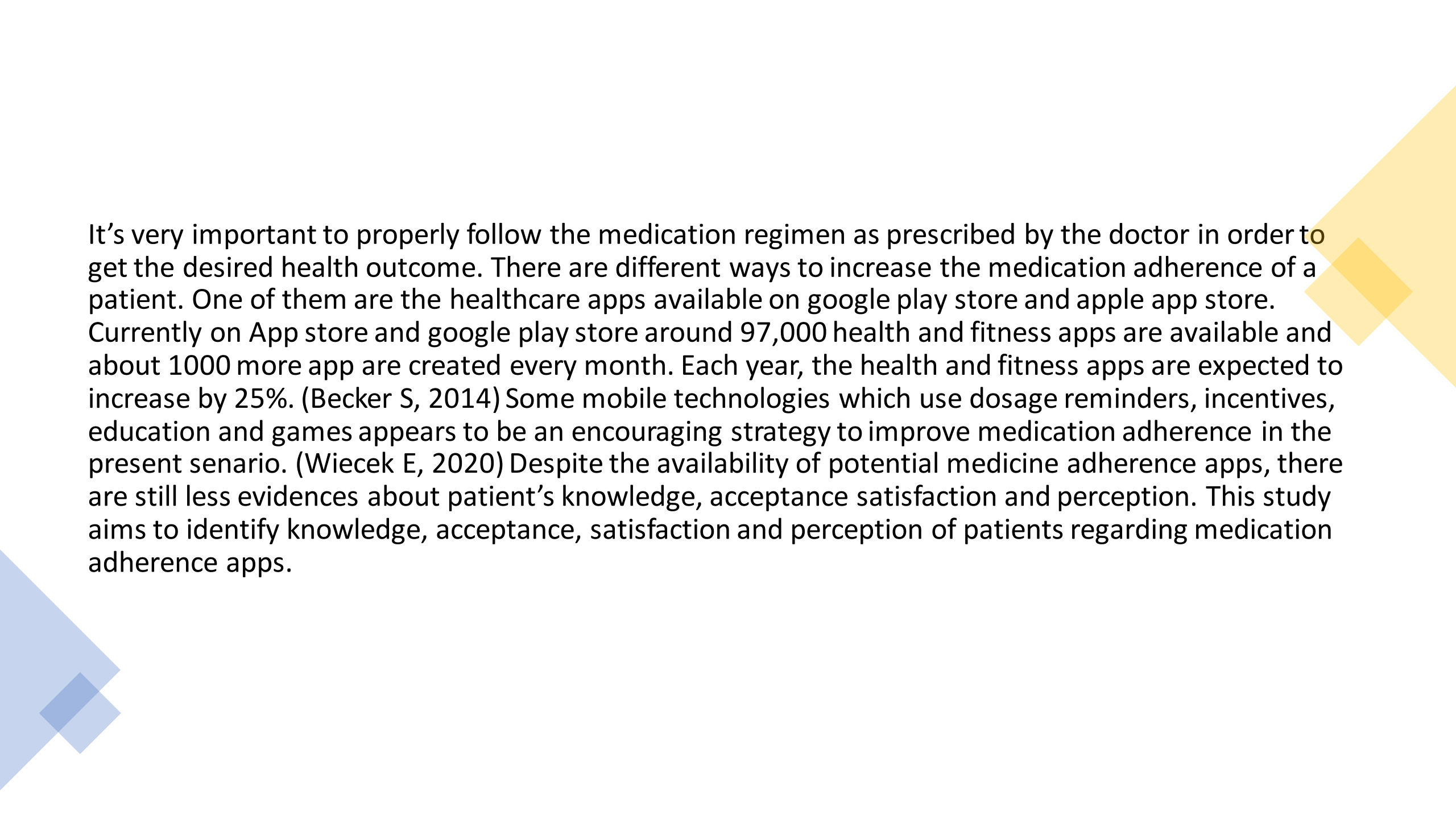
STUDY TO IDENTIFY THE LEVEL OF KNOWLEDGE, ACCEPTANCE, SATISFACTION, PERCEPTION OF USERS TOWARDS A MEDICINE ADHERENCE APP

Dissertation Report

Presented by- Saloni Jain; PM-
11

Introduction

Medication adherence is the extent to which a patient's behaviour coincides with the prescribed medication dosing regimen. (Cramer JA, 2008) (Vrijens B, 2012) In current healthcare system, with the increase in chronically ill patients, medication adherence has become a cause of concern. According to the first Longitudinal Ageing Study in India (LASI) released by the Union Ministry of Family and Health Welfare on January 6 2020, In India, two in every 3 citizens are suffer from a chronic illness (Perianayagam A, 2021). As the patients with chronic diseases are extremely common, Medication non-adherence has become very common and affects 40% to 50% of patients who are taking treatment for management of chronic conditions. (F, 2018)



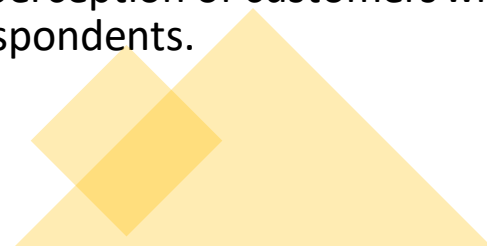
It's very important to properly follow the medication regimen as prescribed by the doctor in order to get the desired health outcome. There are different ways to increase the medication adherence of a patient. One of them are the healthcare apps available on google play store and apple app store. Currently on App store and google play store around 97,000 health and fitness apps are available and about 1000 more app are created every month. Each year, the health and fitness apps are expected to increase by 25%. (Becker S, 2014) Some mobile technologies which use dosage reminders, incentives, education and games appears to be an encouraging strategy to improve medication adherence in the present senario. (Wiecek E, 2020) Despite the availability of potential medicine adherence apps, there are still less evidences about patient's knowledge, acceptance satisfaction and perception. This study aims to identify knowledge, acceptance, satisfaction and perception of patients regarding medication adherence apps.

Review of literature:

- (Ali EE, 2019)The study “User acceptance of an app-based adherence intervention: Perspectives from patients taking oral anticancer medications” aimed to identify the factors that bring an impact on cancer patients to adopt interventions based on health apps for increasing oral anti-cancer medication adherence. The study evaluated the usability of an app-based system to enhance medication adherence. Data was collected from anti-cancer patients taking oral anti-cancer drugs, and audio of the responses were recorded. The results suggest that lack of medication adherence and the use of app instead of their current methods are the key reasons for the adoption of the medication adherence app. Contrary to this, subscription charges, language barrier, and the perception of users for low competence of the health app were the main barriers.
- (Fallah M, 2017)The study “A Medication Reminder Mobile App: Does It Work for Different Age Ranges” aimed at identifying the use of mobile app for medication reminder at different ages of users. The researchers first identified the users for the app. Half of the respondents were above 50 and the rest were below 50 years of age. Next, the application was tested to find the bugs. The application was evaluated by its efficacy and user-friendliness. The users used the application for 10 days and then they were asked to fill the questionnaire. The results suggest that the application was used well by all the users irrespective of their age.



Research objective

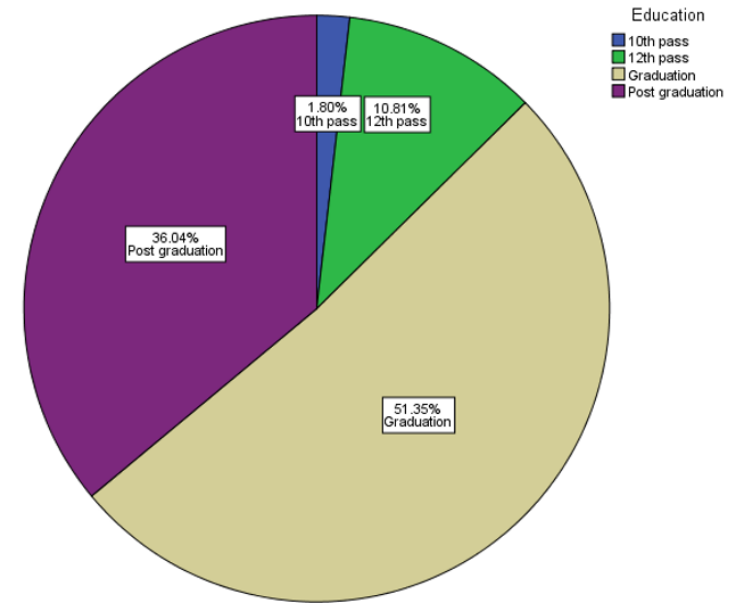
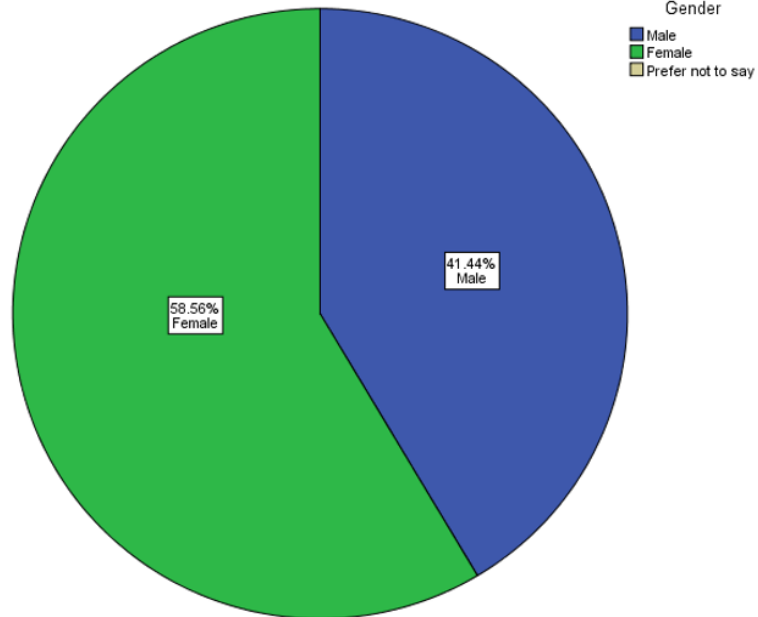
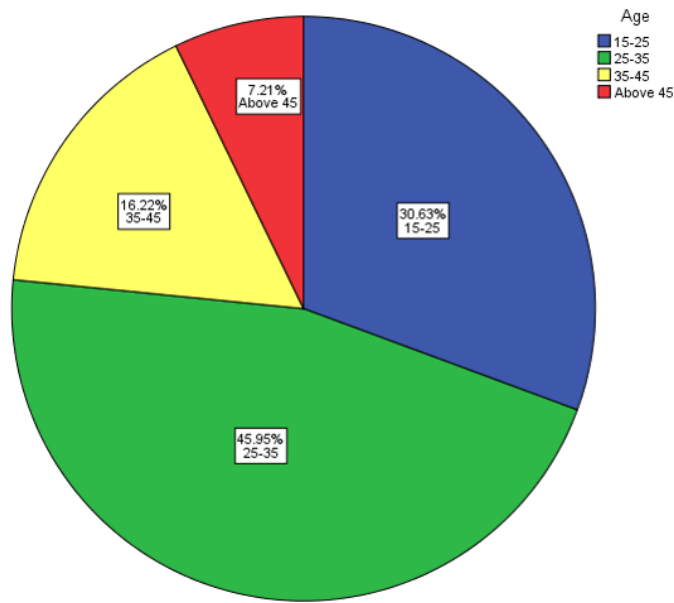
- To identify the level of acceptance of medication adherence app by the users.
 - To identify the level of satisfaction of medication adherence app by the users.
 - To identify the level of knowledge of medication adherence app by the users.
 - To identify the association between Age of the respondent and their perception for medication adherence app.
 - To identify the association between Gender of the user and their perception for medication adherence app.
 - To identify the association between Education of the respondent and their perception for medication adherence app.
 - To identify the favourable and unfavourable perception of consumers for medicine adherence app.
 - To identify the average perception of customers with respect to Age of the respondents.
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Research Methodology

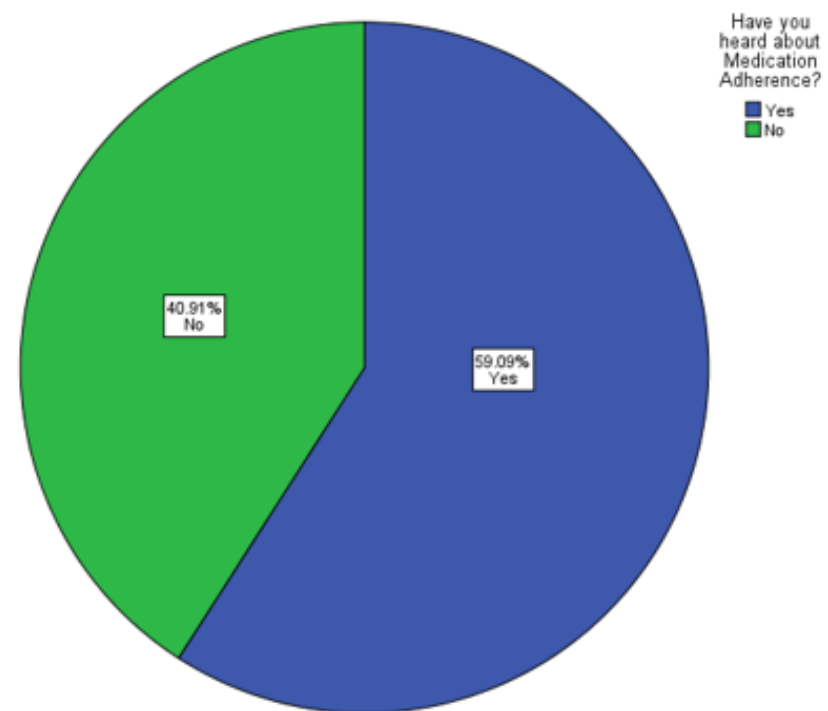
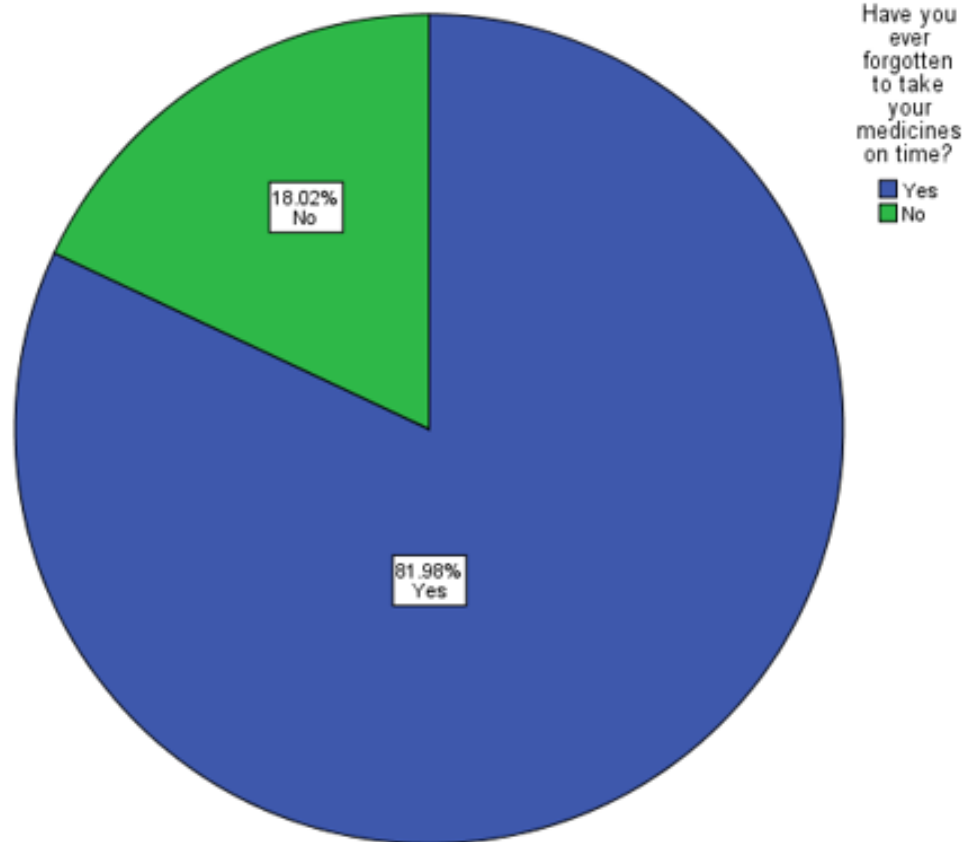
- **Research strategy:** Research strategy is a quantitative research strategy where data is collected through a questionnaire and analysed using statistical means.
- **Study design:** The study type is cross sectional study .
- **Research Instrument:** Well-structured Questionnaire(Google form)
- **Sampling Technique:** Convenient sampling
- Population characteristics: People with age above 15 of either sex will be respondents of the study.
- Sample size: 111 (tentative)
- Ethical approval: Privacy and confidentiality were maintained for the respondents. No identifier variable was used for revealing identity of the respondents. The data collected was analysed in groups rather than individual basis.
- **Data collection:** - Primary data will be received by the respondents during questionnaire and secondary data will be collected from published journals, literature and reference books. Besides this, statistical information will also be assessed in research study.
- **Study period:** 3 Months.
- **Starting date:** 22 Mar 2021
- **End date:** 22 June 2021
- **Data analysis:** - The data analysis in present study will be done by using simple statistical tools which will be used as per the requirement of the data. In this study, appropriate statistical tool is Excel and SPSS 22.
- **Inclusion and exclusion criteria:** - All respondents, male and female users (karma dost) are eligible to participate and are included in the study. Those who are mentally incompetent, unable to listen or speak are excluded from the study.

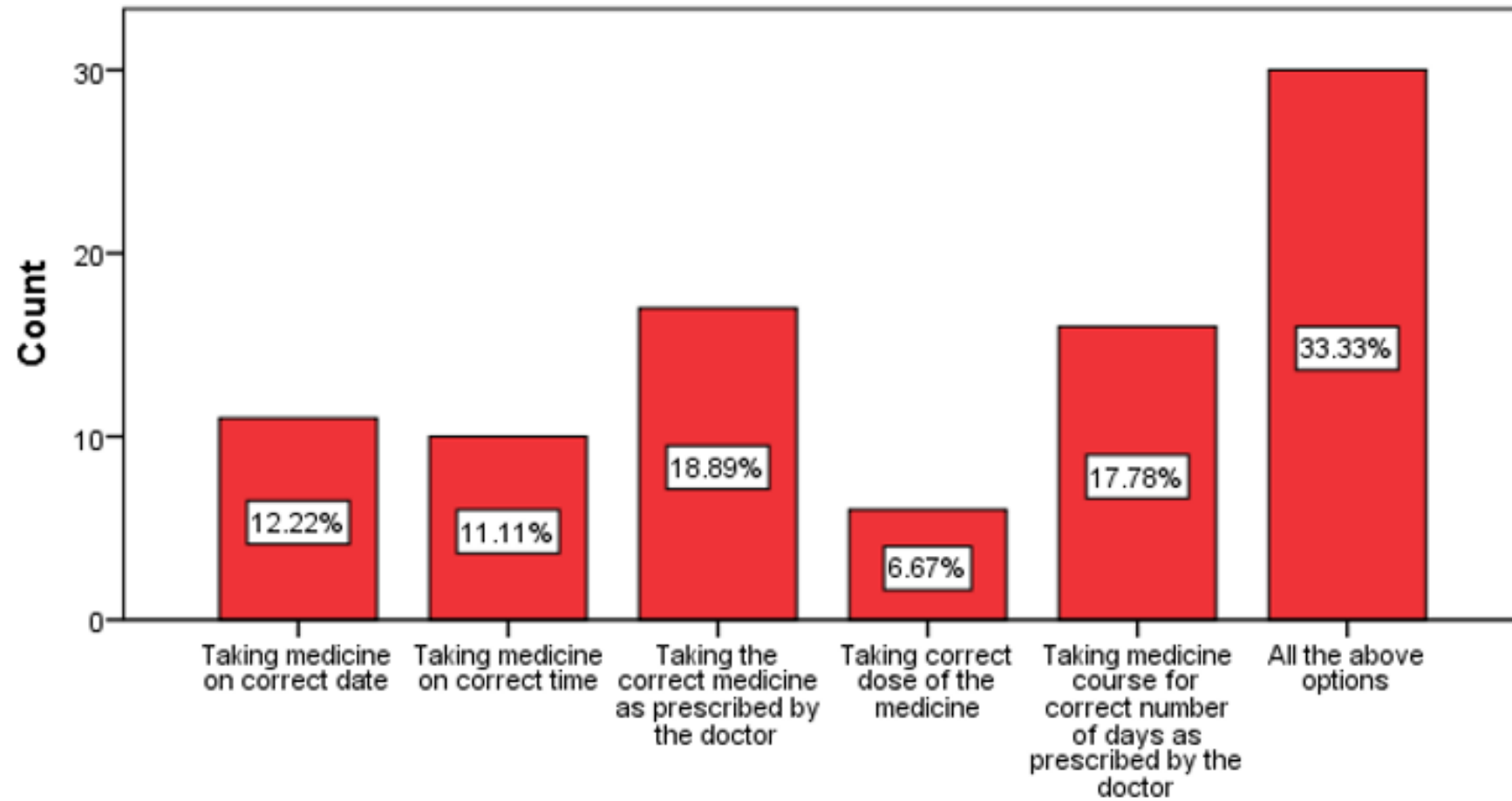


Findings

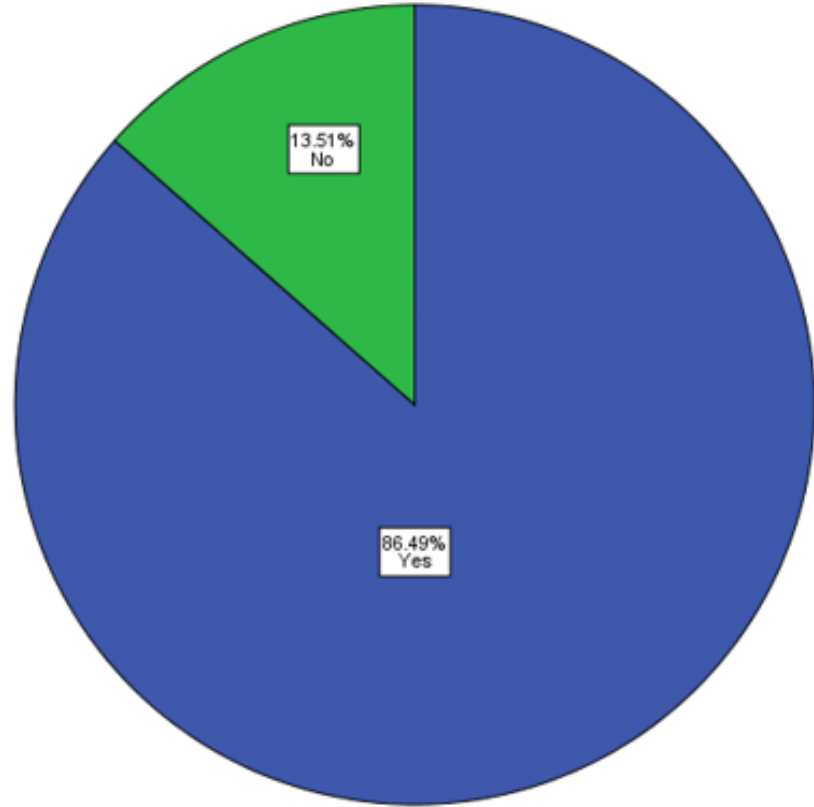


Demographic



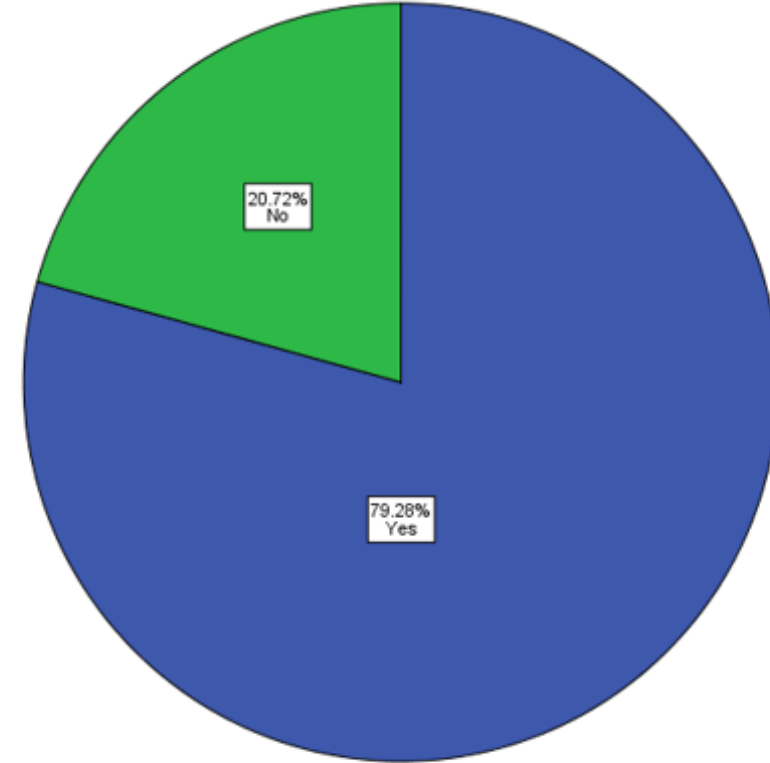


What is medication adherence



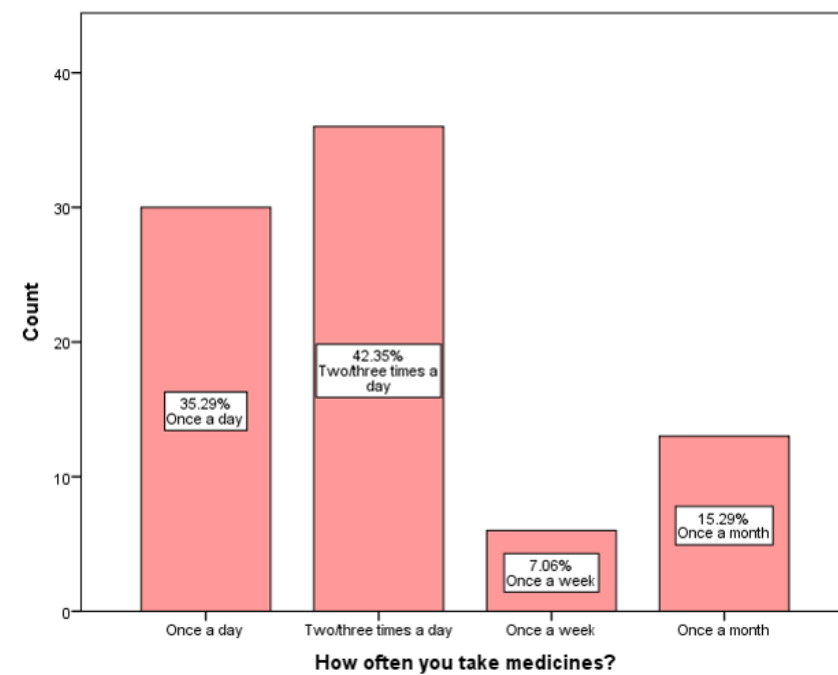
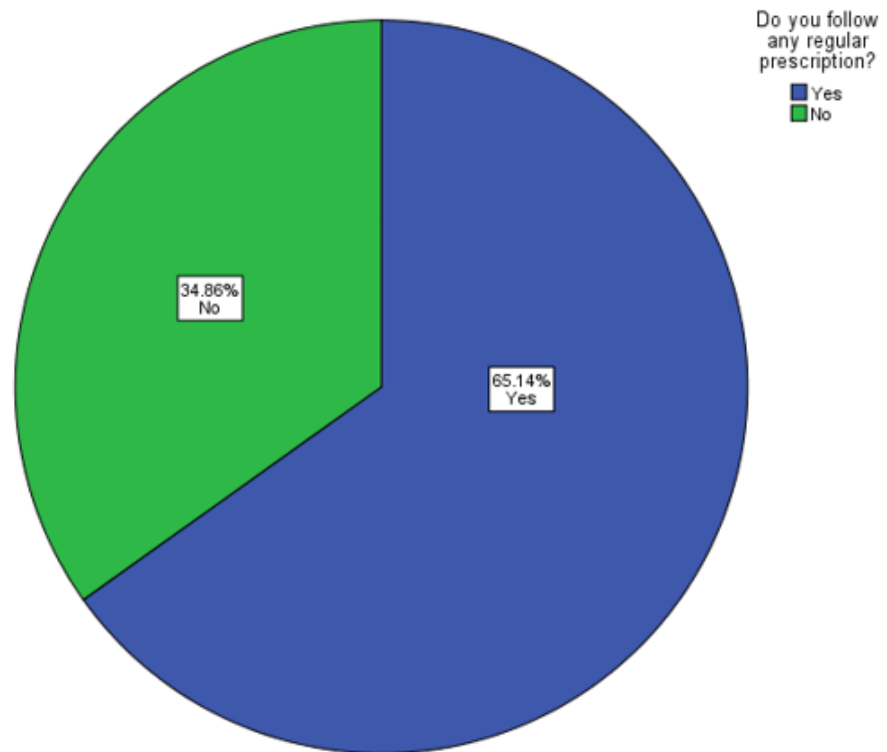
Have you
heard
about
medicine
adherence
apps?

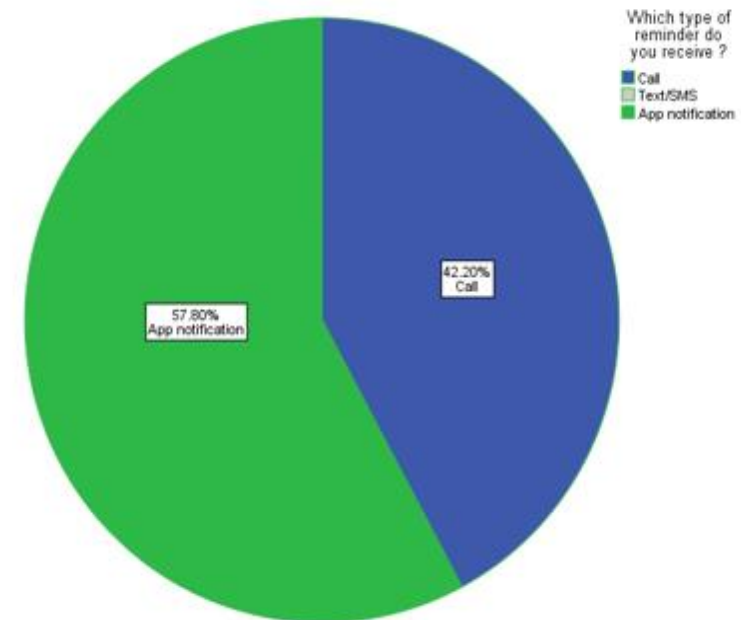
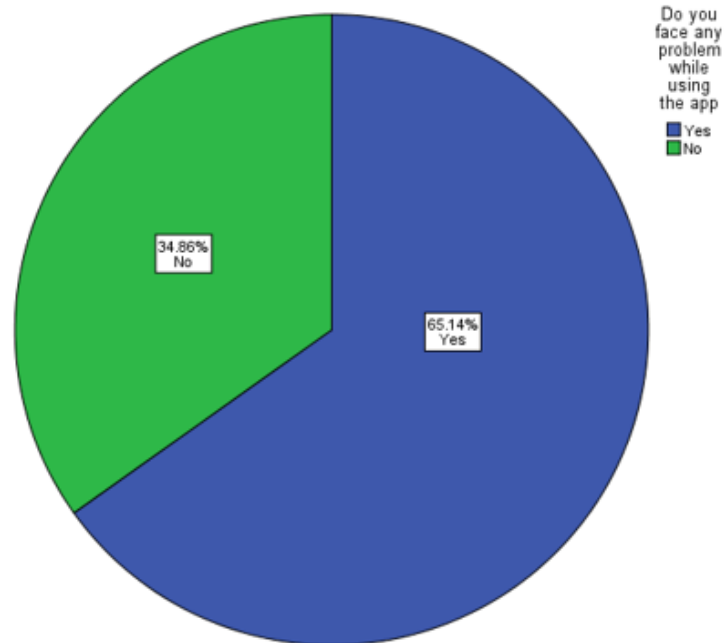
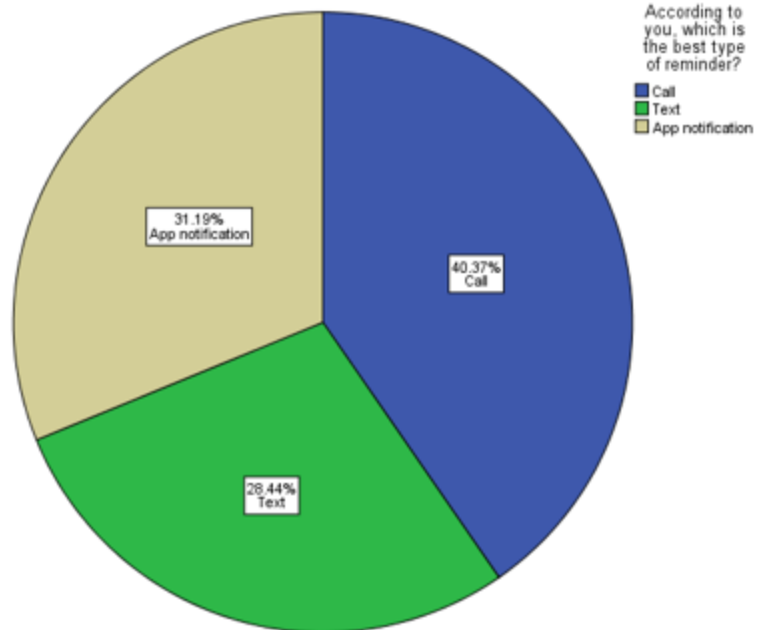
■ Yes
■ No

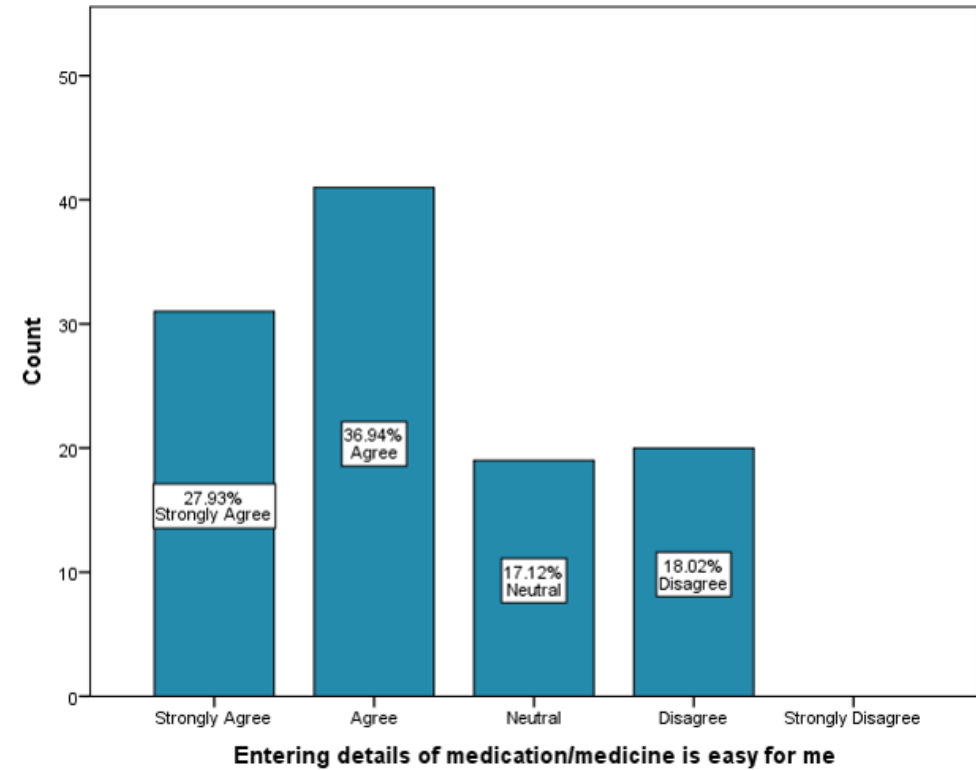
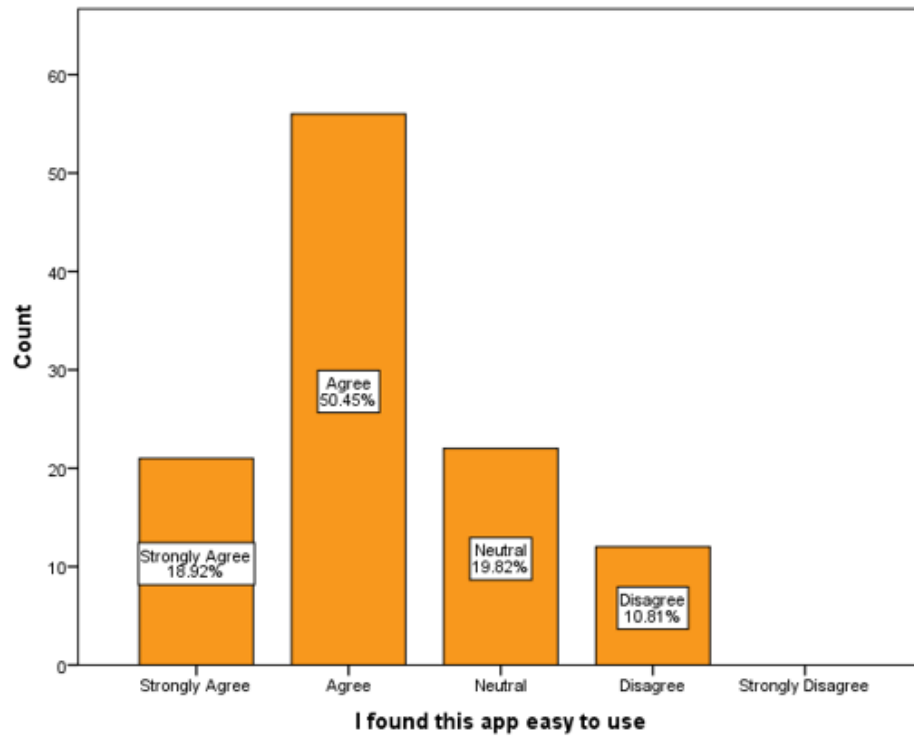


Have you
used any
medicine
adherence
app?

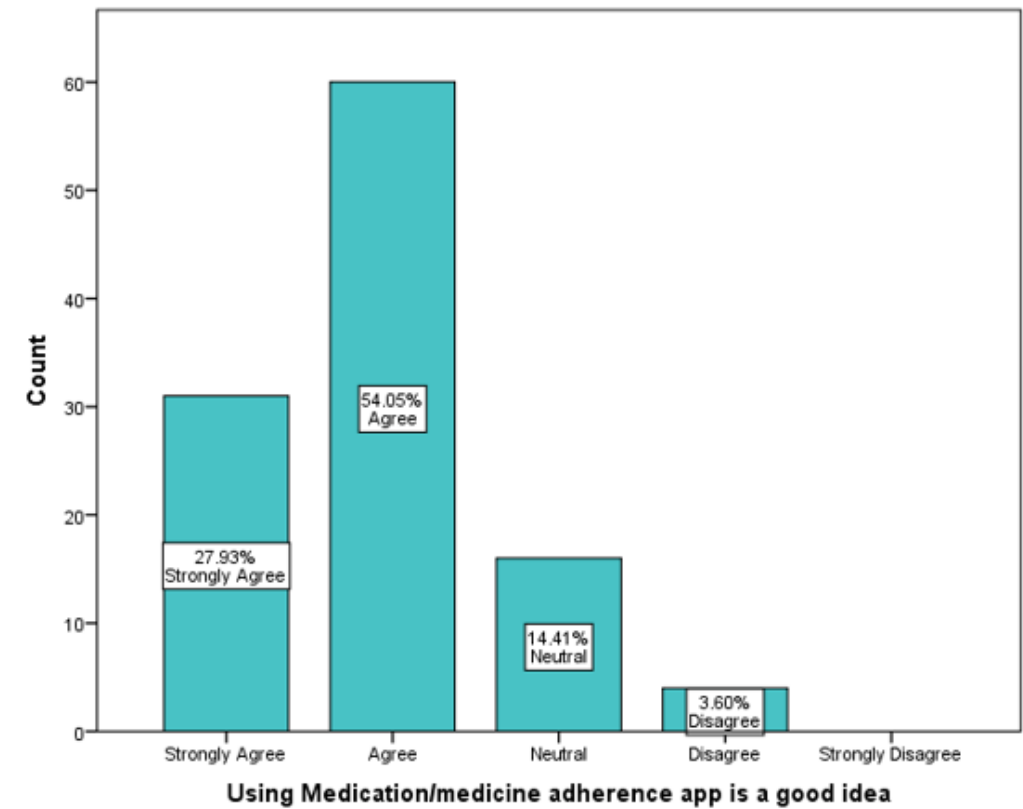
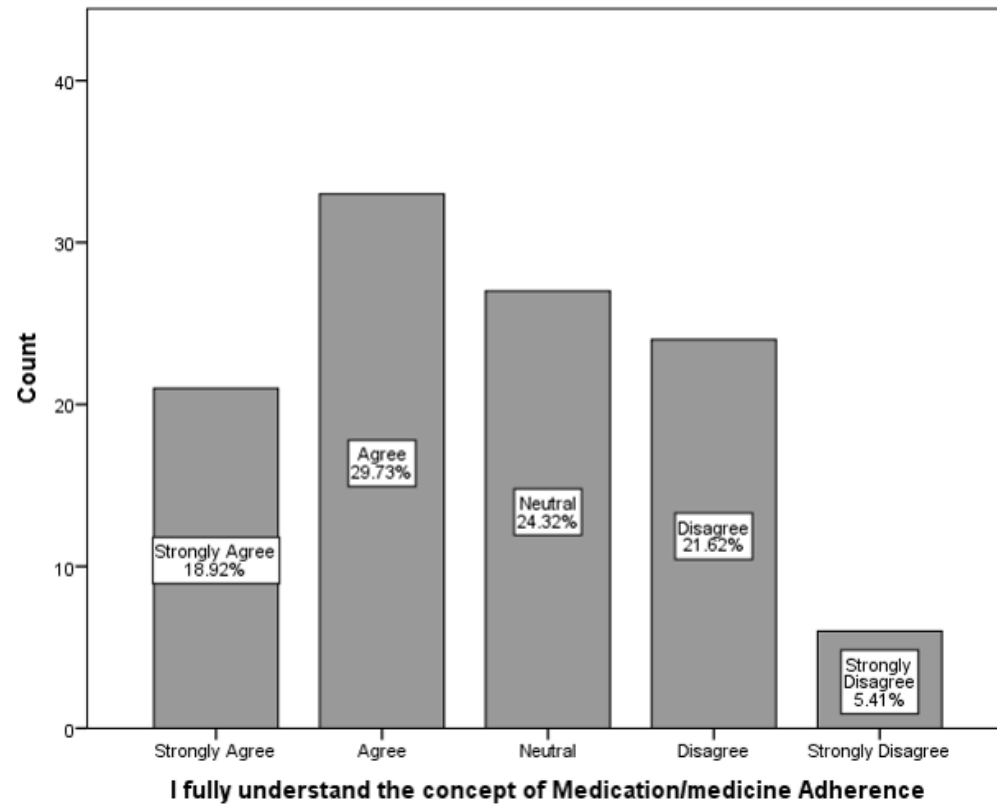
■ Yes
■ No

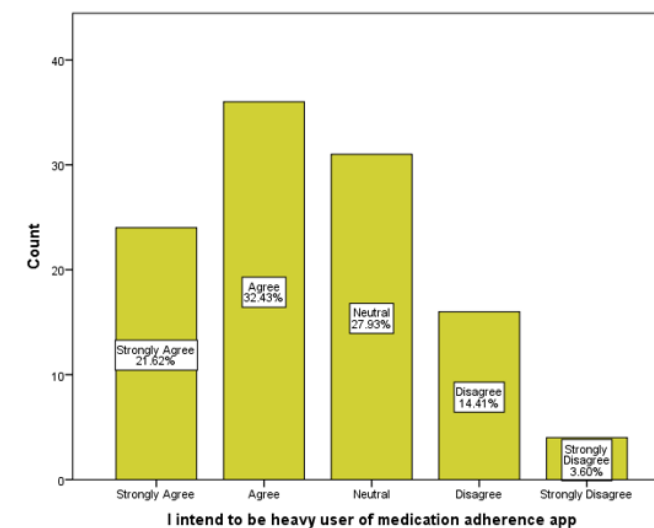
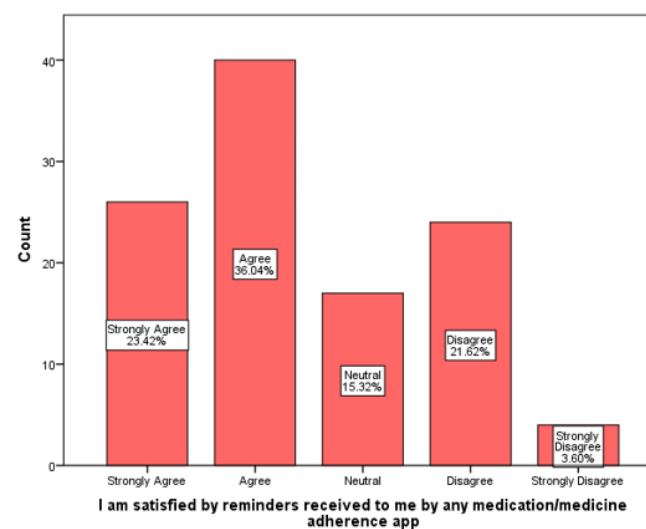
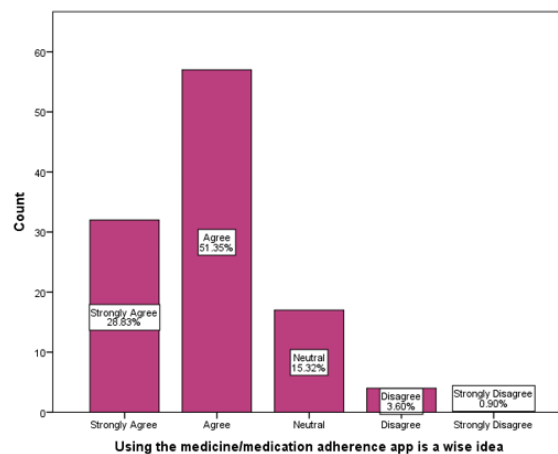


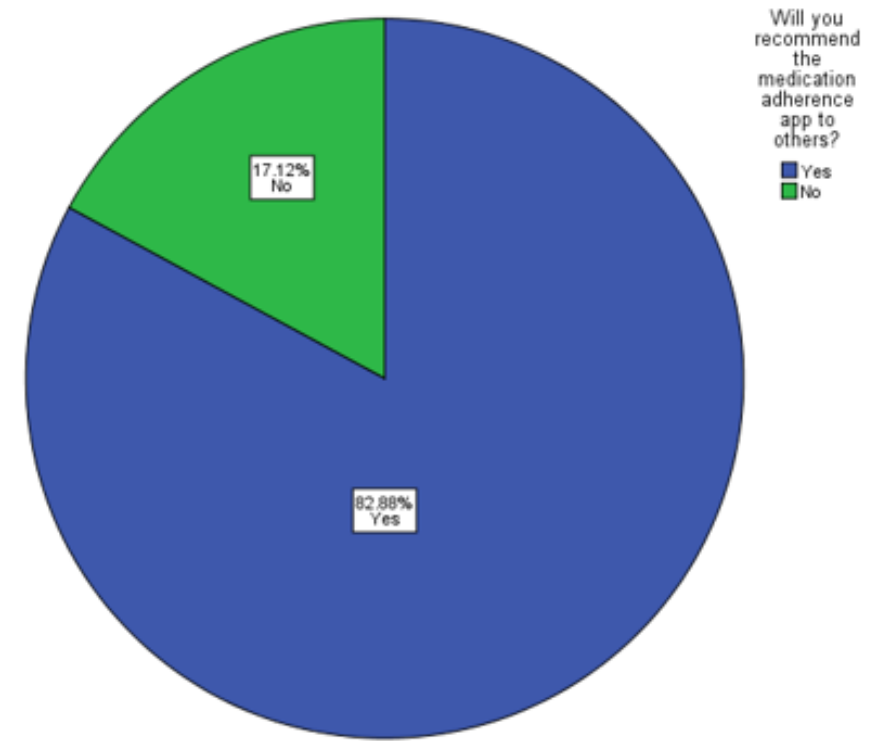
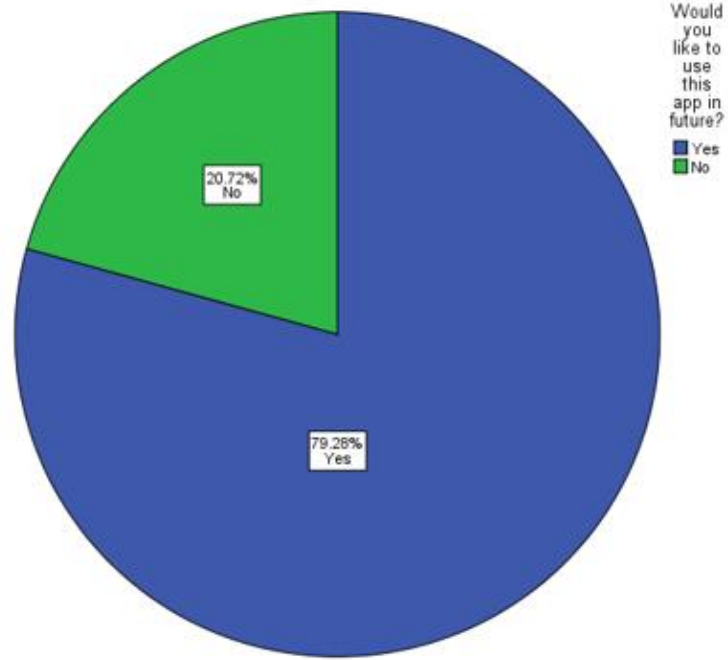


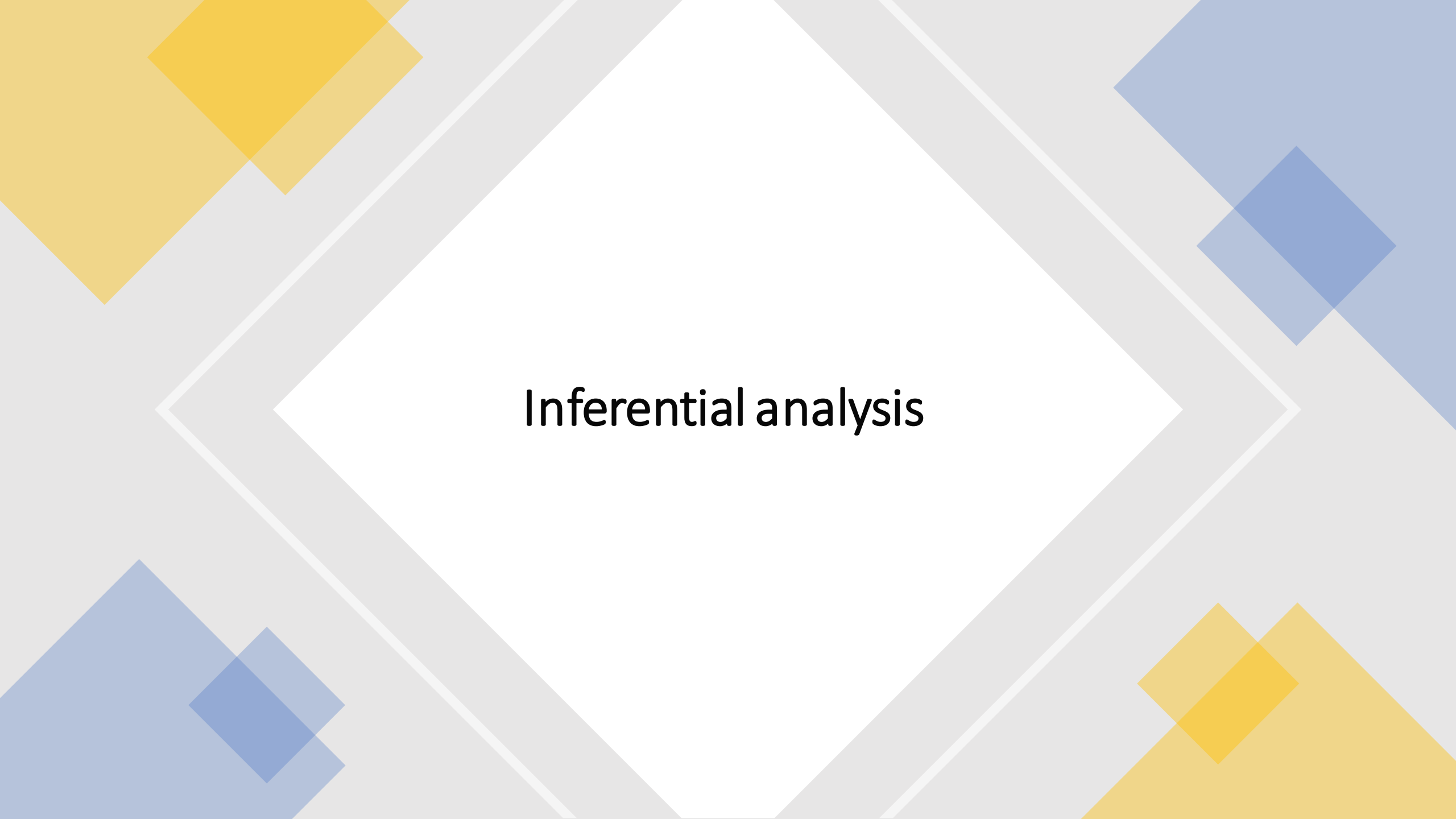


PLEASE EXPRESS YOUR AGREEMENT WITH THE STATEMENT
BELOW REGARDING MEDICATION/MEDICINE ADHERENCE APPS









Inferential analysis

Objective 1. To identify the association between age of the respondent and the perception “I found this app easy to use”

$\alpha = 0.05$

Hypothesis:

- H0: There is no significant association between Age of the respondent and the perception “I found this app easy to use”
- H1: There is significant association between Age of the respondent and the perception “I found this app easy to use”

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	40.702 ^a	9	.000
Likelihood Ratio	27.813	9	.001
Linear-by-Linear Association	6.765	1	.009
N of Valid Cases	111		

Objective 2. To identify the association between Age of the respondent and the perception “Entering details is easy for me”

Hypothesis:

- H0: There is no significant association between Age of the respondent and the perception “Entering details is easy for me”
- H1: There is significant association between Age of the respondent and the perception “Entering details is easy for me”

CHI-SQUARE TESTS			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	22.109 ^a	9	.009
Likelihood Ratio	21.872	9	.009
Linear-by-Linear Association	11.600	1	.001
N of Valid Cases	111		

Objective 3. To identify the association between Age of the respondent and the perception “I intend to be a heavy user of medication adherence app”

Hypothesis:

- H0: There is no significant association between Age of the respondent and the perception “I intend to be a heavy user of medication adherence app”
- H1: There is significant association between Age of the respondent and the perception “I intend to be a heavy user of medication adherence app”

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.313 ^a	12	.589
Likelihood Ratio	10.926	12	.535
Linear-by-Linear Association	1.951	1	.162
N of Valid Cases	111		

Chi-Square Tests

	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	1.216 ^a	3	.749
Likelihood Ratio	1.238	3	.744
Linear-by-Linear Association	.540	1	.462
N of Valid Cases	111		

Objective 4. To identify the association between Gender of the respondent and the perception “I found this app easy to use”

Hypothesis:

- H0: There is no significant association between Gender of the respondent and the perception “I found this app easy to use”
- H1: There is significant association between Gender of the respondent and the perception “I found this app easy to use”

Objective 5. To identify the association between Gender of the respondent and the perception “Using medicine adherence app is a wise idea”

Hypothesis:

- H0: There is no significant association between Gender of the respondent and the perception “Using medicine adherence app is a wise idea”
- H1: There is significant association between Gender of the respondent and the perception “Using medicine adherence app is a wise idea”

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.310 ^a	4	.860
Likelihood Ratio	1.669	4	.796
Linear-by-Linear Association	.006	1	.936
N of Valid Cases	111		

Objective 6. To identify the association between Education of the respondent and the perception “I found this app easy to use”

Hypothesis:

- H0: There is no significant association between Education of the respondent and the perception “I found this app easy to use”
- H1: There is significant association between Education of the respondent and the perception “I found this app easy to use”

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.427 ^a	9	.399
Likelihood Ratio	13.584	9	.138
Linear-by-Linear Association	.496	1	.481
N of Valid Cases	111		

Chi-Square Tests

	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	26.142 ^a	12	.010
Likelihood Ratio	20.644	12	.056
Linear-by-Linear Association	2.605	1	.107
N of Valid Cases	111		

Objective 7. To identify the association between Education of the respondent and the perception “I am satisfied with the reminders received to me by any medication/medicine adherence app”

Hypothesis:

- H0: There is no significant association between Education of the respondent and the perception “I am satisfied with the reminders received to me by any medication/medicine adherence app”
- H1: There is significant association between Education of the respondent and the perception “I am satisfied with the reminders received to me by any medication/medicine adherence app”

One sample t-test

Objective: To identify the favourable and unfavourable perception of consumers for medicine adherence app.

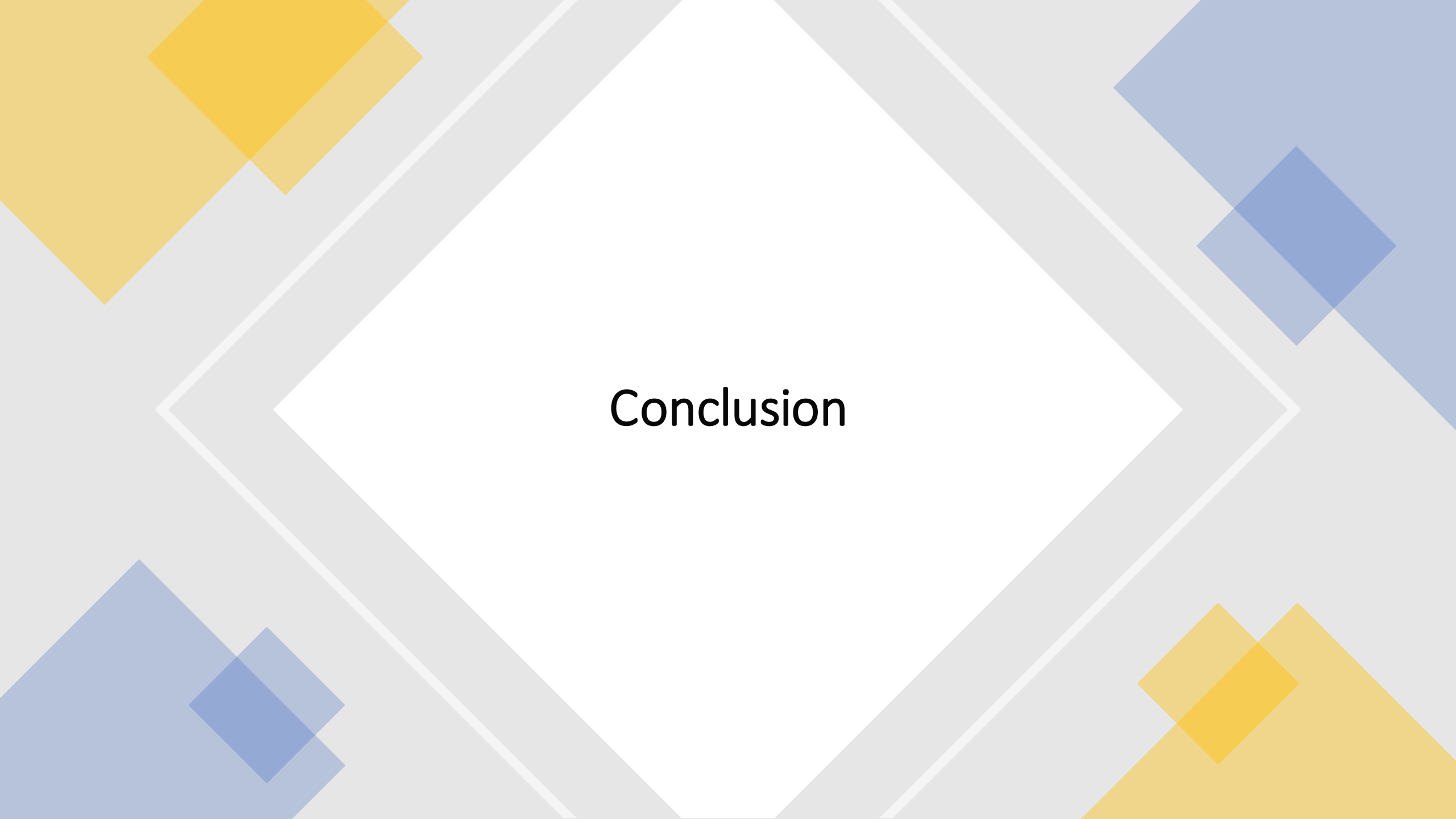
$$\mu=3$$

$$\alpha =0.05$$

One-Sample Test						
	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
I found this app easy to use	-9.266	110	.000	-.775	-.94	-.61
Entering details of medication/medicine is easy for me	-7.452	110	.000	-.748	-.95	-.55
Using Medication/medicine adherence app is a good idea	-14.852	110	.000	-1.063	-1.20	-.92
I fully understand the concept of Medication/medicine Adherence	-3.156	110	.002	-.351	-.57	-.13
I intend to be heavy user of medication adherence app	-5.207	110	.000	-.541	-.75	-.33
I am satisfied by reminders received to me by any medication/medicine adherence app	-4.852	110	.000	-.541	-.76	-.32
Using the medicine/medication adherence app is a wise idea	-13.321	110	.000	-1.036	-1.19	-.88

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
I found this app easy to use	111	2.23	.881	.084
Entering details of medication/medicine is easy for me	111	2.25	1.057	.100
Using Medication/medicine adherence app is a good idea	111	1.94	.754	.072
I fully understand the concept of Medication/medicine Adherence	111	2.65	1.173	.111
I intend to be heavy user of medication adherence app	111	2.46	1.094	.104
I am satisfied by reminders received to me by any medication/medicine adherence app	111	2.46	1.174	.111
Using the medicine/medication adherence app is a wise idea	111	1.96	.819	.078

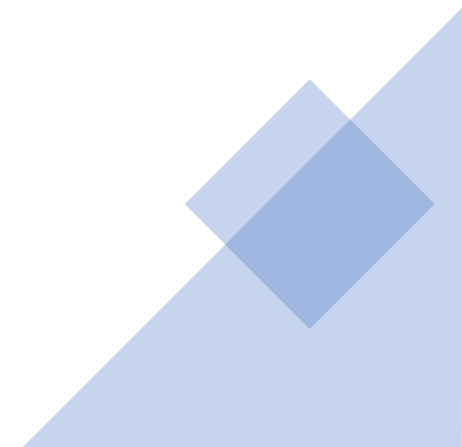


Conclusion



To identify the level of knowledge of medication adherence app by the users.

From the results we can conclude that, more than half of the total population have heard about medicine adherence and 33% respondents have a very clear idea about what is medicine adherence. We analysed that the respondents have positive perception for “I fully understand the concept of Medication/medicine Adherence”. From this we can conclude that more than half of the respondents understand the concept of medicine adherence.





To identify the level of satisfaction for a medication adherence app by the users

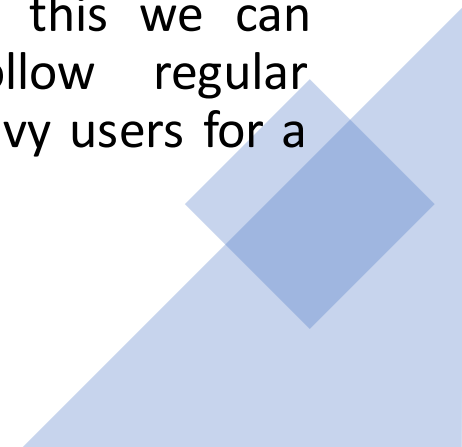
From the results we can conclude that although 65% respondents faced problem while using the app, more than half of the respondents are satisfied by the reminders received by a medicine adherence app, more than half of the respondents found this app easy to use and for more than half of the respondents, entering medicine details is easy for them. And as the respondents have positive perception about the medicine adherence app, 79% respondents are satisfied by the app and would like to use the app in future. To sum up we can say that, level of satisfaction for a medication adherence app is high among the users.





To identify the level of acceptance of medication adherence app by the users.

From the results we can conclude that more than half of the respondents intend to be heavy user of medication adherence app and more than half of the respondents are satisfied by the reminders received to them through medicine adherence app. 79% of respondents are satisfied by the app and would like to use this app in future while 82% respondents would recommend this app to others. From this we can conclude that level of acceptance for a medication adherence app is high among the users. We also analysed that there is association between “Do you follow any regular prescription?” and the perception “I intend to be heavy user of medication adherence app”. From this we can conclude that people who follow regular prescription are expected to be heavy users for a medicine adherence app.





To identify the favourable and unfavourable perception of consumers for medicine adherence app

To conclude we can say that, more than 50% of the respondents have positive perception for ease of use of a medicine adherence app, entering details is easy for them, medicine adherence app is a good idea, understanding the concept of medicine adherence app, intend to be heavy user of medication adherence app, satisfaction by reminders received to users by any medication/medicine adherence app and Using the medicine/medication adherence app is a wise idea.





To identify the association between Age of the respondent and their perception for medication adherence app.

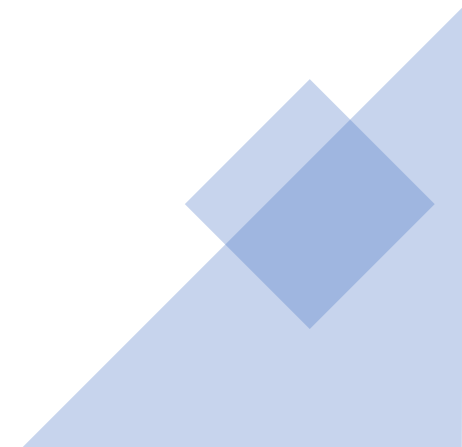
From the results we can conclude that there is a significant association between the age of the user and the perception of ease of use of the app and entering details in the app. No significant association is identified between the age of the user and the perception of continuous use of the app, medicine adherence app being a wise idea and medicine adherence app being a good idea.



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To identify the association
between respondent's
gender and their
perception for medication
adherence app.

From the results we can conclude that there is no association between the gender of the user and the perception of ease of use, continuous use of the app and medicine adherence app being a wise idea.

A series of overlapping blue squares and rectangles of various sizes, some with smaller squares inside them, arranged in a cluster in the bottom right corner of the slide.



To identify the association between Education of the respondent and their perception for medication adherence app.

From the results we can conclude that there is an association between the Education of the user and the perception of satisfaction from the reminders received. There is no association between the education of the user and the perception of ease of use of the app, continuous use of the app and understanding the concept of medicine adherence.





Future research can aim to identify the effect of medication adherence apps on a chronically ill patient. Furthermore, a study can be conducted to identify whether a medication adherence app can help sustain medication adherence rate above 80% for a period of 6-12 months. (Cramer JA, 2008)

Medication adherence apps should not only send reminders, they can educate the people regarding medication adherence and the ill effects of non-adherence. The apps shall also take customer feedback from time to time and improve its services to increase the acceptance and satisfaction level. Increase in acceptance and satisfaction level of a user with respect to a medication adherence app, can lead to increase in rate of medication adherence and the overall health of a person.



Recommendations

- (1)Cramer JA, Roy A, Burrell A, Fairchild CJ, Fuldeore MJ, Ollendorf DA, Wong PK. Medication compliance and persistence: terminology and definitions. Value in health. 2008 Jan 1;11(1):44-7.
- (2)Vrijens B, De Geest S, Hughes DA, Przemyslaw K, Demonceau J, Ruppert T, Dobbels F, Fargher E, Morrison V, Lewek P, Matyjaszczyk M. A new taxonomy for describing and defining adherence to medications. British journal of clinical pharmacology. 2012 May;73(5):691 -705.
- (3) Perianayagam A, Bloom DE, Sekher TV. Longitudinal Ageing Study in India (LASI): An Investigation of Health, Economic, and Social Well-being of India's Growing Elderly Population. 2021 Jan.
- (4) Kleinsinger F. The unmet challenge of medication nonadherence. The Permanente Journal. 2018;22.
- (5) American Medical Association. reasons patients don't take their medications.
- (6) Becker S, Miron-Shatz T, Schumacher N, Krocza J, Diamantidis C, Albrecht UV. mHealth 2.0: experiences, possibilities, and perspectives. JMIR mHealth and uHealth. 2014;2(2):e24.
- (7) Wiecek E, Torres-Robles A, Cutler RL, Benrimoj SI, Garcia-Cardenas V. Impact of a Multicomponent Digital Therapeutic Mobile App on Medication Adherence in Patients with Chronic Conditions: Retrospective Analysis. Journal of medical Internet research. 2020;22(8):e17834.
- (8) Ali EE, Chan SS, Leow JL, Chew L, Yap KY. User acceptance of an app-based adherence intervention: Perspectives from patients taking oral anticancer medications. Journal of Oncology Pharmacy Practice. 2019 Mar;25(2):390-7.
- (9) Fallah M, Yasini M. A medication reminder mobile app: does it work for different age ranges. Stud Health Technol Inform. 2017 May 30;235:68-72.
- (10) Peng W, Kanthawala S, Yuan S, Hussain SA. A qualitative study of user perceptions of mobile health apps. BMC public health. 2016 Dec;16(1):1-1.
- (11) Wiecek E, Torres-Robles A, Cutler RL, Benrimoj SI, Garcia-Cardenas V. Impact of a Multicomponent Digital Therapeutic Mobile App on Medication Adherence in Patients with Chronic Conditions: Retrospective Analysis. Journal of medical Internet research. 2020;22(8):e17834.

Reference

Thank You