

## Willingness of patients to use WhatsApp and Zoom applications for receiving diabetes self-management education: Results of a pilot study

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### Abstract

**Introduction:** Diabetes mellitus is an incurable disease that affects millions of people worldwide and affects the health of patients, often leading to illness and death. Diabetes rates have skyrocketed worldwide over the past few decades as reported in the International Diabetes Federation Atlas (IDF). Diet and physical activity are factors in lifestyle changes that lead to improved glycaemic control and reduced morbidity. There have been growing efforts to introduce new self-regulatory interventions that improve diabetes management. Recently, the use of information technology has increased dramatically leading to improved communication. Social Media is defined as an online-based tool that allows people to connect, collect and share information, ideas and photos, and share with other users in real time. Social media channels such as Facebook, Instagram, WhatsApp, Snapchat, Twitter can mediate digital health interventions, which provide continuous support and effective communication, and overcome barriers related to face-to-face methods. Patients view the social media platform as a source of information about the disease, to communicate quickly and effectively with others and to share medical information with the community of patients with similar problems. **Objectives:** To assess the willingness of diabetic patients to use a self-regulatory tool based on information and communication technology (ICT) such as WhatsApp and Zoom application. **Methods:** Patients with Type-2 diabetes mellitus were tested for capillary blood glucose (CBG) at the Department of Nutrition and Dietetics; and those who gave informed consent were considered in this study. Other information such as age, gender, duration of diabetes, diabetes management knowledge and practices were captured using a survey form. **Results & Conclusion:** During the study a total 111 subjects have answered the questionnaire and 97% respondents showed the willingness to use the WhatsApp and Zoom applications for diabetic self-management education.

**KEYWORDS:** Diabetes self-management, WhatsApp, Zoom, Health education intervention, Diabetes education, Diabetes awareness, Knowledge on diabetes.

## **Introduction:**

Diabetes mellitus is an incurable disease that affects millions of people worldwide and affects the health of patients, often leading to illness and death (1). Diabetes rates have skyrocketed worldwide over the past few decades as reported in the International Diabetes Federation Atlas (IDF). Diet and physical activity are factors in lifestyle changes that lead to improved glycaemic control and reduced morbidity (2). Globally, previous studies have reported that self-study of diabetes controls the levels of glycosylated haemoglobin (HbA1c) and reduces the risk of life-threatening complications. However, patients with diabetes face many obstacles that follow traditional self-regulatory principles such as lack of knowledge about the potential benefits of education, lack of personal education, the cost of diabetes education, and time constraints.

There have been growing efforts to introduce new self-regulatory interventions that improve diabetes management. Recently, the use of information technology has increased dramatically leading to improved communication. (3). Social Media is defined as an online-based tool that allows people to connect, collect and share information, ideas and photos, and share with other users in real time. Social media channels such as Facebook, Instagram, WhatsApp, Snapchat, Twitter can mediate digital health interventions, which provide continuous support and effective communication, and overcome barriers related to face-to-face methods. Patients view the social media platform as a source of information about the disease, to communicate quickly and effectively with others and to share medical information with the community of patients with similar problems. (4).

Social media has become an important tool for people with diabetes to develop self-control skills (5). Patients with similar circumstances and similar experiences connect more easily through the social media platform, providing an ideal place to share information and peer support. However, there is little evidence to support the role of communication in improving behavioural and health outcomes in diabetic patients. Lifestyle changes such as dietary adjustment and physical activity, blood sugar monitoring, online education, peer support and real-time interactions between patients and health workers, are all driven by social media (6). Therefore, health care professionals recommend using social media to improve diabetes management skills and as a result improve glycaemic control.

## **Objectives:**

To assess the willingness of diabetic patients to use a self-regulatory tool based on information and communication technology (ICT) such as WhatsApp and Zoom application.

## **Materials & Methods:**

The study was commissioned by the JSS Medical College Ethics Committee, JSS Academy of Higher Education & Research. The IEC of JSS AHER, is a NABH recognised committee, operates under the guidelines of the Indian Council of Medical Research (ICMR), Govt of India. The first pilot survey data was conducted over a 2-week period at JSS Hospital, an 1800-bed tertiary education teaching hospital, located in the Mysuru district of Karnataka. Patients visiting medical camps (111) were approached with a survey form and taken oral consent to capture the demographic

information followed by knowledge on diabetes and practices related to disease management.

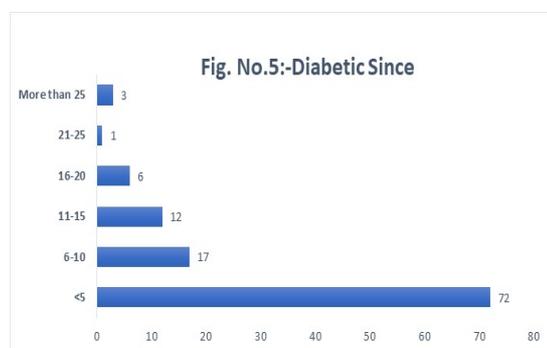
**Results:**

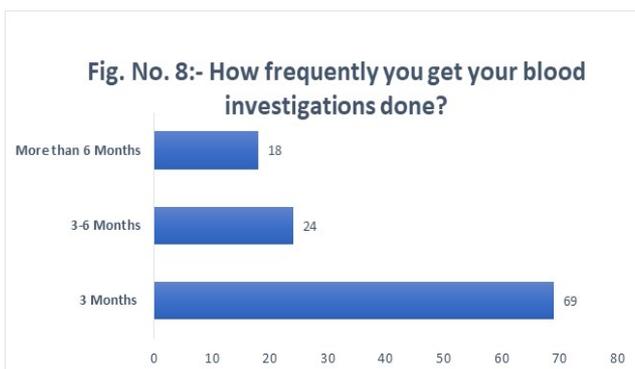
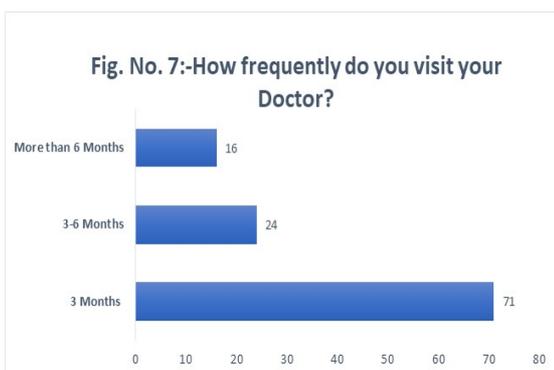
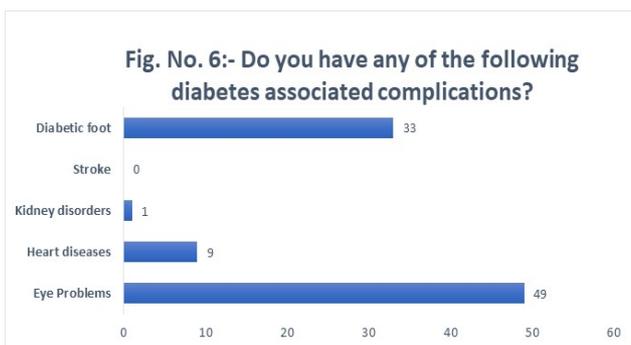
**Demographics of study population:**



Fig 1- Fig 4 represents the demographic details of the study participants. Majority of patients were aged between 51-70 years (60 patients), 36 aged between 31-50 years; whereas 14 below the age of 30 years. Out of 111 patients 86 are males and 25 are females. Patients comes from different domicile category, the semi urban accounts to 55 patients, rural is 53 patients and urban accounts 3 patients. Majority of them were farmers (37/111); 17 patients were homemaker, 17 were daily labour, 13 were government employees, 9 were retired employees and 4 businessmen.

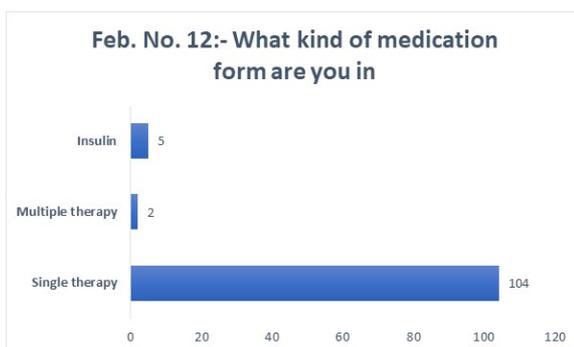
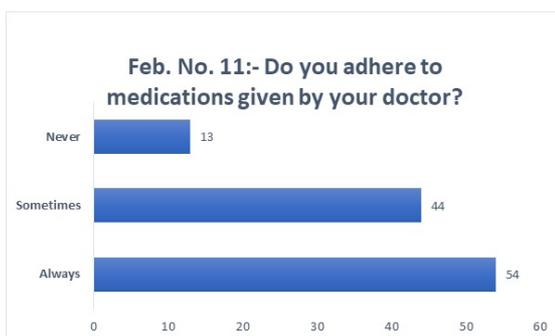
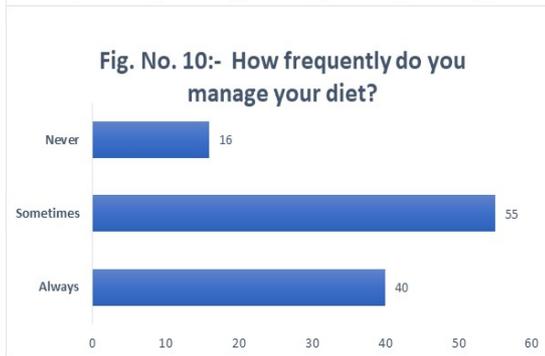
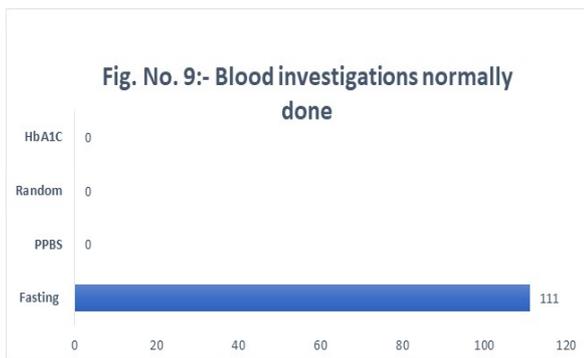
**Participants Diabetes History:**

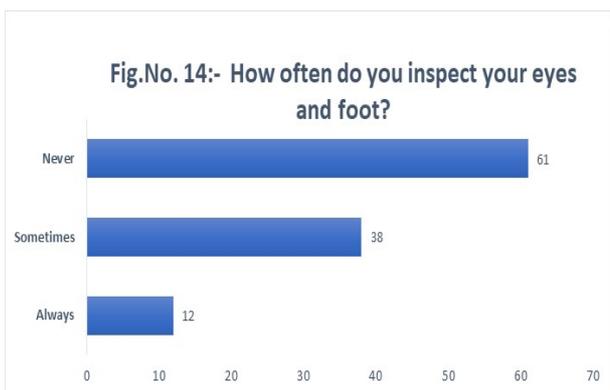
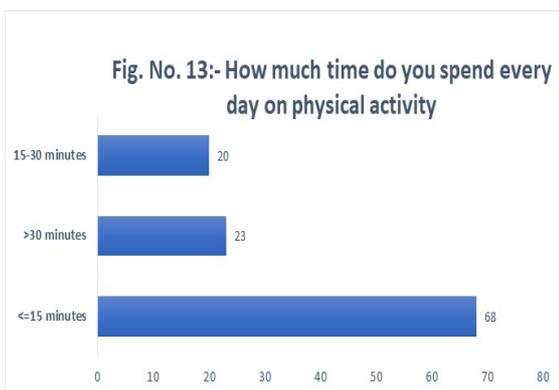




Above figures reflects the diabetes history of patients. Out of 111 patients 72 patients were suffering from diabetes less than 5 years, 17 patients were diabetic since 6-10 years, 12 patients have diabetes since 11-15 years; whereas 6 patients were diabetic since 16-20 years. Very few patients have diabetes for more than 20 years. When checked about the co morbidities associated with diabetes, Eye problem accounts for (49,70%), diabetic foot accounts for (33,47.1%), cardiac diseases accounts for (9,12.9%) and kidney disorders for about 1.4%. 60.4% of patients visits once in 3 months, 21.6% visits between 3-6 months and 18% visits once in 6 months and more. Out of 111 responses, 69 patients go for investigation once in a 3-month, 24 patient gets their blood investigations done once in 3-6 months and 18 patients get the investigations done once in 6 months and more. Interestingly, none of the participants had tested HbA1C before the study.

## Diabetes Management Practices





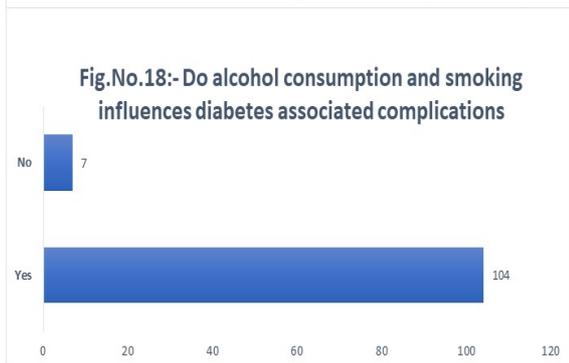
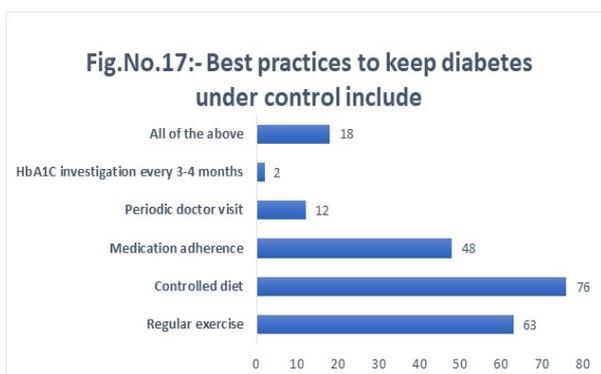
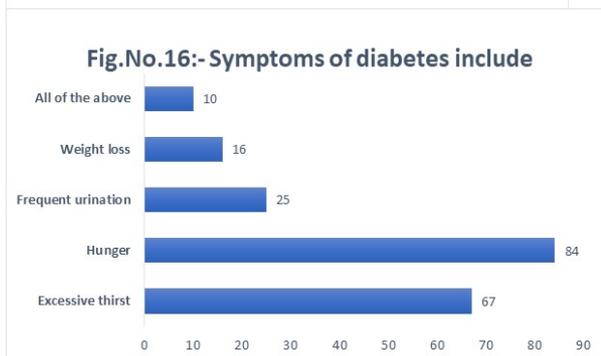
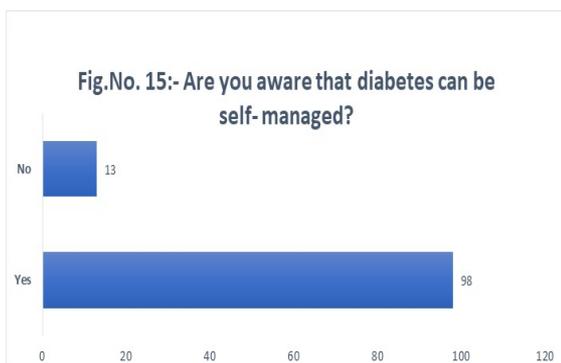
The above figures shows diabetes management practices among study participants. Out of 111 response, fasting blood sugar examination is a routine investigation. None of them were aware of the HbA1C test as one of the indicator tested every 3 months for monitoring diabetes.

Since HbA1C is an important 3-month blood sugar measurement and glycemic control indicator, it is important that adequate instruction and education should be provided to people with diabetes regarding research (7).

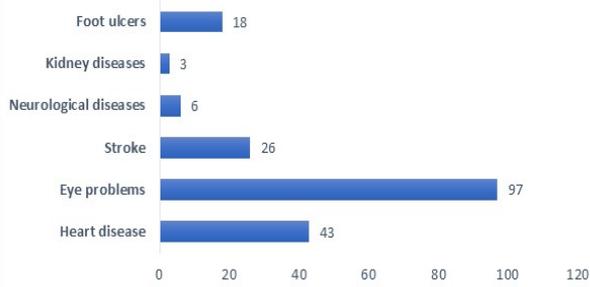
Lack of awareness and cost of HbA1C research (varies from Rs. 200 to Rs. 700 depending on the city) were important factors in not receiving this periodic testing (Ong 2014). Providing this research at affordable prices funded by government health programs or diabetes control programs may encourage patients to get regular check-ups. In addition, research is needed to develop HbA1C-based line-ups that are economical and easy to perform (similar to regular blood glucose monitors), making it more comfortable for diabetic patients to periodically check blood sugar. (Czupryniak 2014).

Out of 111 patients, 55 patients managed their diet sometime, 40 managed always and 16 never managed their diet. 54 patients always adhered to medication prescribed by the doctor, 44 sometimes adhered to the medication as prescribed and 13 never adhered to the prescribed medication. 104 patients adhered to single therapy, 2 patients on multiple therapy and 5 were on insulin. Diabetes can be managed effectively if an individual eats healthy food, exercises regularly and adheres to prescribed medication. Data analysis showed that Out of 111 responses 68 patients spend less than 15 minutes per day, 23 patients spend more than 30 minutes and 20 patients spend 15-30 minutes on physical activity per day.

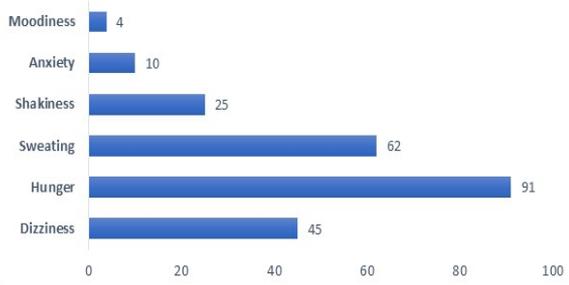
### Participants knowledge on diabetes management:



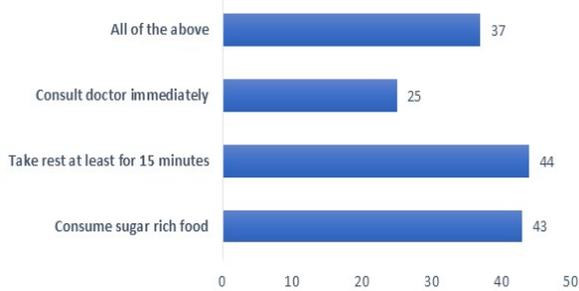
**Fig.No.19:- Uncontrolled diabetes could lead to these diseases**



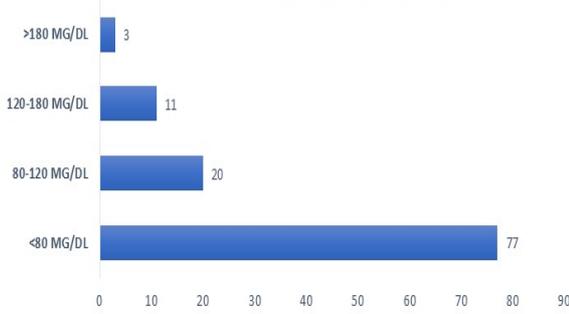
**Fig.No.20:- Symptoms of hypo glycaemia includes**

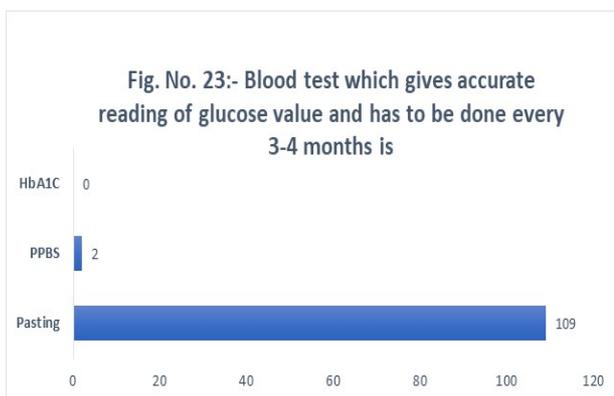


**Fig.No.21:- How do you manage hypo glycemic conditions?**



**Fig. No.22:-Excellent glucose control is indicated by which of the below ranges mentioned**

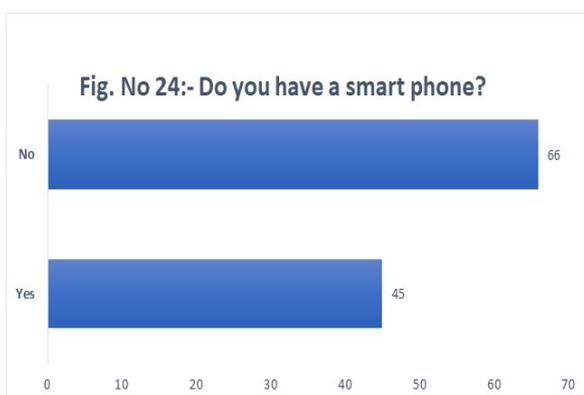


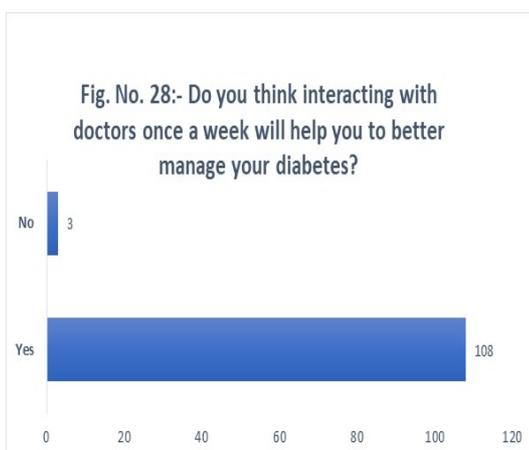
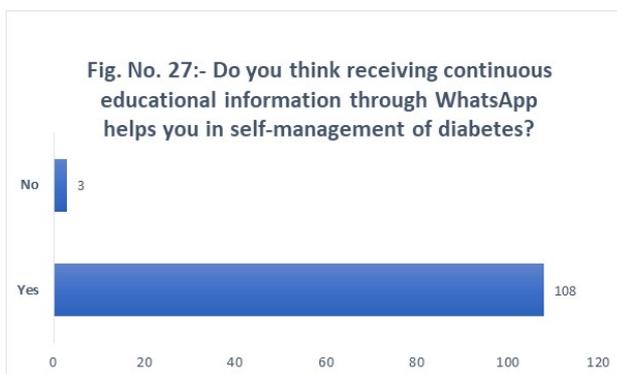
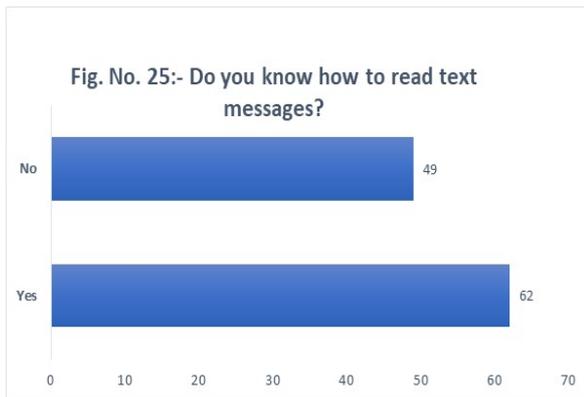


The patient’s awareness about the co morbidities associated with diabetes where regular self-examination of eye and foot is a part of it. 38 patients examine sometime, 61 patients never examine and 12 always do self-examination. 98 patients aware its self-manageable and 13 are not aware of the same. The symptoms experienced by the patients subjectively during diabetes. 84% felt hunger, 67% experienced excessive thirst, 22.5% experienced frequent urination, 14.4% had weight loss, and 9% has experienced all the symptoms.

According to above figures, 68.5% patients believe controlled diet will be a best practice, where as 56.8% believe in regular exercise, 48% say just adhere to medication only, 10.8% believe in periodic doctor visit, and 1.8% say regular monitoring of HbA1C will suffice and 16.2% say combination of all is needed. 104 patients believe it will influence and 7 patients believe no correlation between two. 87.4% of patient believes that uncontrolled diabetes can lead to eye problems , 38.7% feels can lead to heart problem, 22.5% feels diabetes can lead to stroke , 16.2% feels foot ulcers, 5.4% feels neurological diseases and 2.7% feels kidney diseases. 82% feels hunger is the main symptom, 55.9% feels sweating , 40.5% feels dizziness, 22.5% feels shakiness, 9% feels anxiety and 3.6% feels moodiness are the hypoglycaemic symptoms. 39.6% patients take rest at least for 15 minutes, 38.7% patients consume sugar rich food, 22.5% consult doctor immediately and 33.3% do all the above to manage hypoglycaemia. 77 felt below 80mg/dl is excellent control, 20 feels 80-120 mg/dl, 11 feels 120-180 mg/dl, 3 patients feels above 180mg/dl. 109 patient feels FBS is the blood tests that provide an accurate reading of glucose value and should be performed every 3-4 months, and 2 patients feel its PPBS, none voted for HbA1C.

**Patient’s readiness on using WhatsApp and Zoom platforms for diabetes education:**





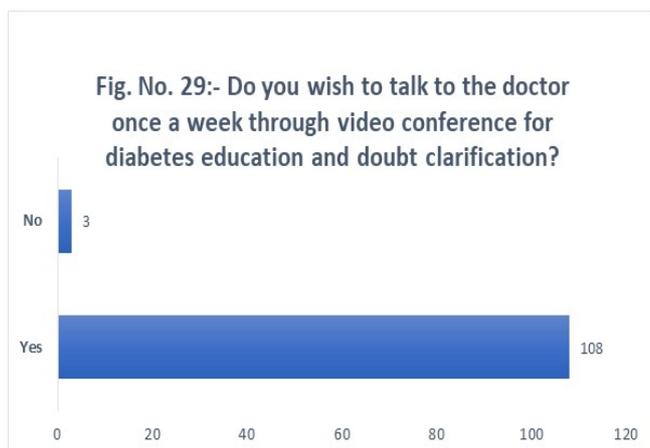


Fig 24-Fig 29 represents about the willingness of the patient for using ICT tools for diabetes self-management. 45 patient said yes and 66 said they do not have smartphone.62 patients said they know to read the text messages.108 respondents said they wish to receive the messages on diabetes self-management education through WhatsApp.108 respondents out of 111 felt the need of receiving continuous educational information through WhatsApp which helps in self-management of diabetes.108 of the respondents expressed that interacting with doctors once a week will help them to manage diabetes better.108 respondents wish to talk to the doctor once a week through video conference for diabetes education and doubt clarification.

### **Discussion:**

Diabetes is one of the leading NCD s causing reduced quality of life, hence the education to self-manage the disease becomes important. The continuous monitoring and education to patient plays important role in the same (8).

The study done by Kundury et al (Kundury & Hathur, 2020) showed a significant decrease in HbA1C values in diabetic patients who had received continuous diabetes education using SMS and Phone calls. The current study is an extension to our earlier research where diabetes self-management educational intervention protocol would be tested with WhatsApp and Zoom applications. Thus, the investigators have planned to conduct preliminary investigations to know the user willingness on accepting the above social networking tools (9).

A cross sectional study by Tomomi Shibuta et al(Shibuta et al., 2017),showed that 93% of the study participants were willing to accept the social networking tools for diabetes education. Current study showed 97% of the subjects had expressed their willingness to use WhatsApp and Zoom applications for the self-management of the diabetes (10).

**Conclusion:** This study examined the willingness of diabetic patients to use WhatsApp and Zoom application for self-management. More than 97% of subject expressed a willingness to use the WhatsApp and Zoom application.

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