

Challenges Faced By Patients in Undergoing Diabetes Care and Management in the Philippines during the Course of the Covid-19 Pandemic

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Abstract: - Diabetes is a chronic metabolic disease defined by high blood glucose levels (hyperglycemia), which is still a public health concern in the Philippines. The COVID-19 virus, caused by the SARS-COV-2 which was first reported in China has rapidly spread in almost all countries around the world, becoming a major global health issue. Patients with underlying medical conditions such as diabetes, are mostly likely to develop the severe form of COVID-19. The COVID-19 outbreak caused people to feel fear and worry, therefore, this research study focused on the challenges faced by patients in undergoing diabetes care and management amidst the COVID-19 pandemic. The research study was conducted through an online survey questionnaire that was administered to three hundred eighty (380) diabetic patients aged 18-59 years old, living in NCR during the COVID-19 pandemic. The patients' status of diabetes care and management during the COVID-19 pandemic, challenges faced by these patients on their diabetes care and management during the pandemic, and the relationship between the patients' profile and challenges faced, and their status on diabetes care and management were considered as variables. All data gathered were analyzed through Microsoft Excel using frequency and percentage. The results showed that there are more female diabetic patients than male. Most of the patients were reported to be employed and working from home. Low gross monthly income was reported among the patients as a consequence of the COVID-19 pandemic. Unstable blood glucose readings and ineffective status of diabetes care and management were reported by most of the patients. Fear of contamination, supply issues, and not being able to leave the house because of high risk were the top three (3) challenges faced by the patients. Based on the findings, the profile and challenges faced by the patients have a significant effect on the patients' status on diabetes care and management. In conclusion, the patients faced challenges accessing diabetes care and management during the COVID-19 pandemic which led to poor or ineffective diabetes management. Expanding the study to other regions of the country is recommended since this study is only focused in NCR. It is also recommended that the government focuses on the innovation, virtualization, and digitalization in healthcare to address gaps such as access of patients to health services. Moreover, it is suggested that the incidence of diabetes be reduced through interventions that promote people's health and quality of life.

Key Words: — *Diabetes, Diabetes care and management, COVID-19 pandemic, Profile, Status, Challenges.*

I. INTRODUCTION

COVID-19 is a known viral disease caused by SARS-CoV-2 virus and is widespread in several continents, and

continues to affect lives all over the world. All individuals are at risk, particularly those with underlying chronic conditions like diabetes, making them more susceptible to developing severe complications from COVID-19. In the Philippines, diabetes continues to be a threat to the society's wellbeing and health care. As claimed by the Department of Health (2017), diabetes is the sixth leading cause of death among Filipinos in 2013. Over six million Filipinos are diagnosed with the disease.

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Diabetic patients are part of the vulnerable population in the rise of the pandemic. This study focused on the challenges the patients face in diabetes care and management amidst the ongoing pandemic.

In 2019, 7.1% of adults aged 20-79 had diabetes, which is a chronic metabolic disease characterized by hyperglycemia (Arcellana & Jimeno, 2020). The escalating incidence of the disease has a massive impact on third-world countries, especially in the Philippines. According to the International Diabetes Federation (2020), there are 3,993,300 diabetes cases in every 63,265,700 Filipino adults, having a prevalence rate of 6.3% in adults. Particularly in NCR, there were a total of 30,212 diabetes cases as of December 31, 2017 (NCDPCP Coordinators, 2017). By 2025, it is anticipated that Asia will witness a tremendous increase in people with diabetes (Tan, 2020).

The COVID-19 outbreak forced significant parts of the Philippines to initiate lockdowns and follow quarantine protocols, with no guarantee that things will go back to normal. The burden of both diseases - diabetes and COVID-19 in the Philippines is heavy. Diabetes, being a chronic disease, necessitates multimodal management incorporating nutritional therapy, pharmacologic therapy, medical therapy, close monitoring, then follow up (Arcellana & Jimeno, 2020). If left untreated or undertreated, the condition will worsen, leading to the accumulation of sugar in the blood. This also leads to complications resulting in damage to vital organs that leads to premature death (CDC, 2020). Visible complications include amputation to the lower extremities, heart disease, blindness, failure of kidney operations, as well as being prone to infections. The quarantine measures have made diabetes care more challenging than ever. Health practitioners can only handle a limited number of patients since they are busy treating COVID-19 patients.

The coronavirus pandemic gave rise to barriers that hindered the proper implementation of diabetes care and management. Due to the emergence of this pandemic, not only are hospitals and clinics forced to close most of their outpatient facilities from face-to-face consultations, but they are also not able to perform most laboratory and imaging investigations just like before (Shin et al., 2020). Patients that require complex therapeutic regimens such as multiple daily injections (MDI) or insulin and continuous subcutaneous insulin infusion (CSII) are the ones who will feel the weight of such circumstances (Maddaloni et al., 2020). The high cost of medications,

especially for underprivileged individuals who have difficulty purchasing their medicines even before this pandemic, is the most frequent barrier to diabetic patients. Moreover, refilling of prescriptions in the setting of an enhanced community quarantine remains a daunting task. The usage of old medications remains unclear, whether or not old prescriptions should be considered valid in pharmacies during this time of the pandemic (Arcellana & Jimeno, 2020). Increased risk of acquiring obesity is caused by stress and physical inactivity at home (Nouhjah & Jahanfar, 2020), as well as the daily routine of most people during these times have increased the occurrence of a sedentary lifestyle and psychological burden for diabetic patients (Maddaloni et al., 2020). All of these activities will result in a change in glucose control.

Diabetic patients are especially susceptible to the harsh consequences of the COVID-19 pandemic. As stated by Arcella & Jimeno (2020), consistent management of blood sugar is required to prevent an immunocompromised state that leads to an increased risk of contracting and developing the complications of acquiring COVID-19. Nam et al. (2011) suggested that identifying barriers to diabetes management is required to improve the quality of diabetes care, including the improvement of metabolic control and diabetes self-management. Therefore, it is crucial to know and understand the impact of the pandemic on people living with diabetes to improve the overall health conditions of the patients.

This study aimed to gather data regarding the diabetes care and management of Filipino patients suffering from the said disease amidst the pandemic. With the health conditions of these patients compromised during these times due to their weakened immune system caused by the disease, as shown by the studies conducted about it, it is pertinent that the government must take timely action to remedy the situation they are in to keep them safe from being affected by the virus while managing the care of their disease.

1.1 Objectives of the Study

The general objective of the study was to determine the challenges faced by patients undergoing diabetes care and management during the COVID-19 pandemic in the Philippines.

The specific objectives of the study were the following:

- To determine the socio-demographic profile of diabetic patients in the Philippines.
- To determine the self-assessed status of diabetes care and management during the COVID-19 pandemic.
- To determine the challenges faced by these patients on diabetes care and management during the COVID-19 pandemic.
- To determine if the patients' status on diabetes care and management is affected by their profile and challenges they faced during the COVID-19 pandemic.

1.2 Problem Statement

The study generally aimed to determine the challenges faced by patients who have diabetes in obtaining quality diabetes care and management during the COVID-19 pandemic.

Specifically, the study sought to answer the following questions:

- What is the socio-demographic profile of diabetic patients in the Philippines
- How would the patients assess their status of diabetes care and management during the COVID-19 pandemic?
- What are the challenges faced by these patients on diabetes care and management during the COVID-19 pandemic?
- Is the patients' status on diabetes care and management affected by their profile and challenges they faced during the COVID-19 pandemic?

1.3 Hypothesis of the Study

H0: The patients' status of diabetes care and management was not affected by their profile and challenges they faced during the COVID-19 pandemic

H1: The patients' status of diabetes care and management was affected by their profile and challenges they faced during the COVID-19 pandemic

1.4 Research Impediments

The main purpose of this study was to identify the challenges encountered by patients in the care and management of diabetes amid the COVID-19 pandemic for effective management of the disease. This study was limited to the Philippine setting,

particularly the National Capital Region (NCR), and did not include the challenges in diabetes care and management of other countries. The respondents of the study were limited to 380 diabetic patients, aged 18-59 years old, who are residents of NCR during the COVID-19 pandemic. This sample size was based on the 2017 data from NCDPCP, which was the latest data available on the internet as of 2020. This study was descriptive correlational research, and data gathering was limited to conducting surveys through online platforms because of the restrictions imposed by the IATF as part of the protocols during the COVID-19 pandemic.

1.5 Significance of the Study

The findings of the study would be beneficial to the following:

Diabetic Patients. This study would be an opportunity for them to inform the government and healthcare providers about their current situation, especially the challenges they are facing in managing their disease during the COVID-19 pandemic. Furthermore, this study could establish recommendations that will air the concerns of the patients.

Health Care Providers. This study would serve as a way for these healthcare providers to analyze, examine, and evaluate the challenges for diabetes care and management in the Philippines. In addition, possible recommendations and actions for improvement may be established by these health care providers to alleviate and deal with the problem.

The Government. This study would help the government discover the current situation of diabetic patients in the Philippines and the challenges they face in managing the disease during the COVID-19 pandemic. Moreover, this study could recommend possible actions the government could establish to deal with these challenges and help these diabetic patients.

Medical Technology Students. This study would give the researchers further knowledge about diabetes care and management in the Philippines during the COVID-19 pandemic.

Future Researchers. This study could serve as a source of information and data that future studies may use. This may also be an inspiration or a basis for many complex research studies in the medical field.

1.6 Definition of Terms

For clarity and a better understanding of the study, the following terms were defined based on the research content.

COVID-19 pandemic. This global health crisis, caused by the new coronavirus, was declared on 11 March 2020 by the World Health Organization (WHO).

Diabetes. A chronic condition in which the body cannot properly convert the food into energy.

Diabetes care and management. This is a system of coordinated healthcare interventions and communications for diabetic patients to encourage them and guide them in self-managing their illness and help them improve their conditions and overall quality of life.

Diabetes maintenance drugs. These are the prescribed medications for diabetic patients that are taken on a regular, recurring basis.

Diabetic nutrition. This refers to the diet used by people with diabetes to minimize symptoms and dangerous complications of long-term elevations in their blood sugar.

Diabetic patient. This is an individual suffering from high blood sugar levels.

Hyperglycemia. High blood sugar.

Hypoglycemia. Low blood sugar.

Impediments. These are the barriers to acquiring proper care and management on the treatment of diabetes.

Medical needs. These are the health care services provided to a patient by a physician to help evaluate, diagnose, or treat diabetes.

Pharmacologic therapy. This refers to the treatment of diabetes through the administration of certain drugs.

Quarantine measures. These are the limitations of face-to-face contact and mobility restrictions that are necessary to prevent the spread of COVID-19 disease.

Significant changes. The measurement of the effect of the treatment being done on diabetic patients. This is to measure whether the treatment is taking effect in helping them get better or not.

Vulnerable populations. These are the groups and communities with a higher risk of contracting COVID-19 infection due to the manifestation of conditions that affect their immune system.

II. THE REVIEW OF RELATED LITERATURE

Diabetes, along with other non-communicable diseases, make up six of the top ten leading causes of mortality in the Philippines as stated by the DOH. According to the Philippine Health Statistics (2016), diabetes is the 6th leading cause of death, which makes up 5.7% of total deaths for both sexes. The paper also shows that the disease is the 8th leading cause of mortality for males (4.9%) and the 5th leading cause of mortality for females (6.8%). According to a census from the International Diabetes Federation (2020), the prevalence of diabetes in the adult population of the Philippines for the second quarter of 2020 reaches 6.3 percent. Diabetes remains a significant public health concern as the prevalence of the disease increases year by year since 1980. The most common type of diabetes in the Philippines is NIDDM or Type II diabetes, which makes up for most of the cases of diabetes. It has a 9-year incidence of 16.3% and a prevalence of 28.0% from 1998 to 2007 (Soria et al., 2009). Gestational diabetes is problematic as it affects both the mother and the offspring. This type of diabetes is substantially prevalent in the Philippines, which affects 14% of pregnancies (AFES Study Group on Diabetes in Pregnancy, 1996). There are no nationwide incidence or prevalence studies about Type 1 diabetes in the Philippines. According to a publication by UNITE for Diabetes Philippines (2008), there exists a survey by Castillo-Cruz that shows a very low prevalence of type 1 diabetes with only 7 cases among children aged 0-14 in a small municipality in Bulacan from 1989 to 1998.

According to the third policy note of the UP COVID-19 Pandemic Response Team (2020), it revealed that the physician density in the Philippines as of April 2020 is at best 10 per 10000 population in the National Capital Region while the lowest ratio is seen in the Bangsamoro Autonomous Region of Muslim Mindanao (BARMM) with only 0.8 physicians per 10000. This reveals that there is a remarkable inequality in physician distribution in the country. The data shows that

access to physicians, such as endocrinologists, is inferior in underdeveloped regions. Diabetic Care in the Philippines is reported to have a balanced performance across all areas except in policies and funding (IDF, 2014). According to the data from the Family Income and Expenditure Surveys (2018), half of the families categorized under the lower income bracket spend most of their medical expenditures on the purchase of medicinal drugs. Most of these households pay these fees out of pocket, which eventually takes their toll on the financial status of these families. A health insurance would help cover these fees and medical costs. PhilHealth is a government insurance corporation attached to the DOH that aims to provide universal health care coverage for Filipinos (Philhealth, n.d.). Through PhilHealth Circular No. 017s 2014, PhilHealth reimburses a substantial amount for treatment and coverage of maintenance drugs for non-communicable diseases, especially diabetes. However, limited medications for diabetes are covered by the insurance. Other measures done by the government to curb the rising incidence of diabetes and alleviate the disease burden include programs by the DOH such as the Diabetes Awareness campaign, which is held every fourth week of July, aiming to educate people about diabetes.

Handling the medical care of patients in the Philippines is difficult, brought about by a doctor-patient ratio of 1:33,000, (Sandoval, 2016) whereas the ideal ratio imposed by the World Health Organization (WHO) is one doctor for every 10,000 persons. Because of the pandemic, diabetes management became more challenging since most healthcare professionals are deployed to battle against the crippling COVID-19 pandemic. The people who have diabetes are both the direct and collateral damage of this pandemic. Diabetes is a chronic disease, and it requires multimodal management integrating medical nutritional and pharmacologic therapy, exercise, close monitoring, and follow-up (Arcellana, 2020). The mobility of the healthcare system is limited due to the protocols and safety measures deployed to minimize the spread of COVID-19 in the country. The risk of nosocomial diseases for immunocompromised patients, such as diabetic patients, is also a problem when going to a hospital for a check-up. Insulin is a necessity in managing diabetes due to the pancreas no longer secreting insulin. Moreover, insulin is a prescribed drug, meaning a patient needs a physician's prescription to purchase it in pharmacies. Disparities in health care delivery and drug access make this situation worse (Nouhjah, 2020.)

III. THEORETICAL STUDY

Chronic illnesses demand extensive care and management in maintaining health and improving the overall outcome of the patient. A middle-range theory by Riegel et al. (2012) of Self-Care of Chronic Illness indicates that self-care is considered important in the management of chronic illness. The theoretical basis took into account the difficulties that patients had in taking care of themselves when their options were to fulfill the needs determined by their chronic illness (Riegel et al., 2012). According to the theory, most patients seek care because they want alleviation from symptoms caused by their illness or its treatment, especially within the structured health care system. It also highlighted the importance of engagement and cooperation between healthcare providers and patients in encouraging patients to connect with and integrate self-care into their lifestyle. This philosophy has embraced the role of health care practitioners in supporting self-care and focuses specifically on how patients act and cope with their chronic disease.

Self-care maintenance, self-care monitoring, and self-care management were described as three major principles in the theory. Patients with chronic illnesses engage in self-care maintenance to maintain their physical and mental well-being. Self-care monitoring is the practice of observing one's own indications and symptoms for changes. Finally, self-care management is the process of responding to indications and symptoms as they arise. When applied to chronic illness, these three key concepts must follow the recommendations of healthcare providers (Riegel et al., 2012). Moreover, it is believed that adherence to therapies and systematic and routine monitoring is essential in attaining the best outcomes.

As practicing and promoting self-care is an extremely challenging process for both patients and clinicians, this theory describes the factors which influence self-care, including experience, motivation, habits, culture, skill, confidence, functional and cognition, and support from others, and access to care. This study is mainly concerned with the access to care of individuals with chronic illness, specifically diabetic patients during the COVID-19 pandemic. The theory recognized the significance of using the health-care system to get care and its impact on the patient's overall health. However, many of these persons with chronic illnesses do not have access to healthcare providers within the organized health care system for a variety of reasons, which leads to poor health outcomes.

IV. RESEARCH DESIGN

4.1 Subjects and Study Site

This study was conducted in the National Capital Region (NCR). According to the Department of Health (2020), the National Capital Region is the one with the most number of COVID-19 cases among the regions in the Philippines. Hence, it is placed by the Inter-Agency Task Force under stricter restrictions that affect the diabetes care and management of the patients. The target population for this study was three hundred eighty (380) diabetic patients living in NCR during the pandemic. The researchers limited the age group to diabetic patients aged 18-59 years only, for the reason that individuals under the age of 18 need parental consent, and individuals above the age of 59 are considered senior citizens. Both groups were excluded from this study because they are part of the “vulnerable” population. Purposive sampling was used for selecting the respondents of the study. This method belongs to nonprobability sampling techniques, where the respondents are selected based on their knowledge and relationship about the research topic (Freedman et al., 2007).

In this study, the respondents selected were individuals, aged 18-59 from the National Capital Region, confirmed to be diagnosed with diabetes by examining the proof of diagnosis submitted in the pre-survey section of the questionnaire. The respondents participated in the survey through the use of Google Forms. The minimum recommended sample size was 380 respondents. Sample size (n) was calculated using the following formula: $x = Z(c/100)^2r(100-r)$ and $n = Nx/((N-1)E^2+x)$, where $Z(c/100)$ is the critical value of the confidence level (95%), r is the fraction of response (50%), E is the margin of error (5%), and N is the population size of diabetic patients in NCR as of December 31, 2017.

4.2 Data Measure/Instrumentation

This study utilized a questionnaire to quantify the data gathered. The questionnaire used in this study was adapted from the International Diabetes Federation (IDF) European Region and the researchers had sought their approval in adapting the questionnaire for the purpose of this study. The researchers received an email from the IDF European Region that granted them permission to use and adapt the questionnaire. The researchers, however, modified the said questionnaire based on what is needed in the study.

4.3 Data Gathering Procedure

Quantitative data were gathered using an online survey questionnaire due to the limitations imposed by COVID-19. The online standardized survey questionnaire was adapted from IDF which also focuses on the challenges of diabetes care and management during COVID-19. The survey obtained information on the effects of patients' profile and the challenges they faced on their status on diabetes care and management during the COVID-19 pandemic.

The initial copy of the survey was submitted to the Ethics Board Committee for approval. After approval, the questionnaire underwent pilot testing for a test of comprehensibility. After the validation of the questionnaire, final revisions were applied. After finalization, the researchers selected the respondents using purposive sampling that fits the inclusion criteria, including male or female, ages 18-59 diabetic patients coming from the National Capital Region (NCR). A consent form was given to the respondents to inform them about the purpose of the study, the procedures involved, and the risks and benefits of participating in the study. A pre-survey questionnaire was first given to the respondents before proceeding to the actual survey questionnaire. This was to ascertain that the respondent meets the qualifications for the purpose of this study. The researchers asked for proof of diagnosis which may include drug prescription, medical certificate, or blood analysis results from a reputable diagnostic center, or from a diabetologist or an internist. The consent form, together with the pre-survey and a survey questionnaire were distributed through online platforms targeting 380 respondents. The URL link of the questionnaire was shared through different social media sites such as Facebook, Instagram, or Twitter. It was also shared with different diabetic groups found on social media sites. The link was also sent to the acquaintances of the researchers for more effective dissemination. The answers were gathered from the questionnaires, which were quantified by tallying each response. Together with the help of a statistician, the researchers generated the results gathered from the questionnaire. After the generation of statistical results, the researchers analyzed the results, and conclusions were made. The results were kept confidential in order to protect the identity of the respondents.

The informed consent form was given to the respondents together with the questionnaire through Google Forms to make sure that the respondents were fully informed regarding the purpose of the study. The respondents were allowed to refuse

to participate in the study without penalty. Participation was entirely voluntary and if he or she decided to participate, withdrawal from the study at any point was possible. The consent form also asked the respondent to share personally identifiable information for verification purposes. Guaranteed that all personal information was used exclusively for research purposes and that the identity of the respondents remained confidential. The questionnaire provided confirmation from the respondents on their agreement and consent for participation in this research study.

The duration of the study was approximately ten months. It took approximately ten to twenty minutes for the respondents to accomplish the online survey questionnaire.

4.4 Ethical Consideration

An informed consent form, together with the survey questionnaire, was given to the willing respondents online. The respondents were free to withdraw anytime they did not wish to participate in the survey anymore. They were asked beforehand if they would allow the researchers to release their answers for research purposes. They were aware of the purpose of the study and that no name or any identifying information will be accessible to anyone else but the researchers. They remained anonymous for confidentiality reasons. Moreover, to ensure that the study did not, in any form, cause harm and violate any rights and privacy of the respondents, this thesis proposal was submitted to the Faculty of Pharmacy – Ethics Review Committee for evaluation and to secure ethics clearance.

4.5 Data Analysis

In order to obtain an understanding of the respondents, descriptive statistics was used. Descriptive statistics are techniques that are designed to provide an idea of the distribution of your variables (George & Mallery, 2016). Frequencies and percentages were utilized to better organize and summarize categorical data to explain these variables; status of diabetes care and management during the pandemic, challenges faced by diabetic patients on their diabetes care and management during the pandemic. To further look into the relationship between the status of diabetes care and management during the pandemic of the patients and the challenges they faced during the pandemic, the researchers made use of Pearson r coefficient of correlation. All of the statistical tests were performed in Microsoft Excel.

V. RESULTS AND DISCUSSION

This chapter contains the results gathered from the survey-questionnaire that was done and how they were treated and analyzed. It presents the results of the statistical analysis and the interpretation of findings. The results are presented through the use of tables and figures.

5.1 Socio-Demographic Profile

This section presents the demographic profile of the patients which includes their employment status, monthly family income, and their sex.

Table.1. Socio-demographic profile of the patients

| Employment Status | | | Gross monthly income of the family | | |
|--|------------|-------------|------------------------------------|------------|-------------|
| | f | % | | f | % |
| Employed - at usual place at work | 56 | 14.74% | Below P10,957 | 9 | 2.37% |
| Employed - working from home | 191 | 50.26% | P10,958 to P21,914 | 117 | 30.79% |
| Housewife/househusband | 31 | 8.16% | P21,915 to P43,828 | 131 | 34.47% |
| Self-employed - working from home | 55 | 14.47% | P43,829 to P76,669 | 44 | 11.58% |
| Temporarily not working because of COVID-19 (but still employed) | 4 | 1.05% | P76,670 to P131,483 | 4 | 1.05% |
| Unemployed | 11 | 2.89% | P131,484 to P219,140 | 4 | 1.05% |
| Student | 7 | 1.84% | Prefer not to Answer | 71 | 18.86% |
| Retired | 23 | 6.05% | Total | 380 | 100% |
| Others | 2 | 0.53% | | | |
| Total | 380 | 100% | | | |

| Sex | f | % |
|--------------|------------|-------------|
| Male | 151 | 39.74% |
| Female | 229 | 60.26% |
| Total | 380 | 100% |

The table shows 60.26% of the patients are females while the remaining 39.74% are males. It can be inferred that females are more likely to have diabetes than men as per the publication made by the Philippine Health Statistics (2016) where diabetes is the 5th leading cause of mortality for the females (6.8%) while 8th leading cause for men (4.9%).

The patients are mostly employed while working at home (50.26%). Moreover, the patients' monthly gross income is primarily P10, 958 to P21, 914 (30.79%) and P21,915 to P43,828 (34.47%). The data shows that the patients are mostly in the Low-income but not poor and lower middle income bracket as identified by the Philippine Institute for Development Studies (PIDF, 2018).

5.2 Status of Diabetic Patients during COVID-19

This section contains information on how well the patients were able to manage their diabetes, as well as other variables that may serve as an indicator of their status such as blood glucose readings and glycemic control. It also contains the eating habits and food planning method employed by the diabetic patients during the COVID-19 pandemic and how able they were to follow their intricate diet despite the possible challenges on diabetes food supplies. It contains information about the diabetes treatment taken by the patients, as well as their ability to follow their diabetes regimen. Lastly, it discusses the ability of the patients to receive any form of diabetes care and consultations during the pandemic

5.2.1 Management of Blood Glucose Levels:

During the COVID-19 pandemic, 46.58% of the patients were able to measure their blood glucose levels the same as before the pandemic started. However, there is a significant group of patients (45.53%) who had a decrease in the frequency of measuring their glucose levels. This is likely due to the difficulty in obtaining POCT or measuring devices for blood glucose such as the glucometer which is seen in Table 16 in section 4.3.

Table.2. Management of Blood Glucose Levels

| Frequency of Blood Glucose Measurement | f | % | State of Blood Glucose Levels | f | % |
|--|------------|-------------|-------------------------------|------------|-------------|
| More than usual | 25 | 6.58% | More stable than usual | 27 | 7.11% |
| Same as usual | 177 | 46.58% | About the same | 149 | 39.21% |
| Less than usual | 173 | 45.53% | More variable than usual | 202 | 53.16% |
| Not applicable | 5 | 1.32% | Not applicable | 2 | 0.53% |
| Total | 380 | 100% | Total | 380 | 100% |

When it comes to the state of their blood glucose levels during the pandemic, about 53% of the patients reported that their levels have been more variable than usual, while a significant population of 39.21% of the total patients reported that their levels are the same as before the pandemic. The data shows that the majority of the patients were unable to effectively manage their blood glucose levels during the pandemic. Upon further analysis, 68.32% of the patients who reported having more variable glucose readings apparently measure their glucose levels less than usual. Variability in the readings in spite of lesser frequency of measurement may be explained by the patient's inability to continuously monitor and control their glucose levels, thus resulting in a spike in measurements.

5.2.2 Glycemic Control:

About three-fourths of the patients had an episode of hypoglycemia. A majority of the total patients, which constitutes 36.32%, reported that there were no differences between the number of hypoglycemic events prior and during the pandemic, with some 35.53% of the patients reported that they experienced these hypoglycemic events less than before. The results show that a significant number of the patients were able to control their blood glucose levels in a way that lessens the frequency of hypoglycemic events. The lower frequencies of hypoglycemia may be due to the prevalence of Type II diabetes in the Philippines. Hypoglycemia is much more common in Type I diabetes but it can also occur in Type II diabetes.

Table.3. Blood glucose status of the patients

| Hypoglycemic episodes | f | % | Hyperglycemic episodes | f | % |
|-----------------------|-----|--------|------------------------|-----|--------|
| More than usual | 17 | 4.47% | More than usual | 216 | 56.85% |
| Same as usual | 138 | 36.32% | Same as usual | 120 | 31.58% |
| Less than usual | 135 | 35.53% | Less than usual | 31 | 8.16% |
| None | 90 | 23.68% | None | 13 | 3.42% |

| | | | | | |
|--------------|------------|-------------|--------------|------------|-------------|
| Total | 380 | 100% | Total | 380 | 100% |
|--------------|------------|-------------|--------------|------------|-------------|

There were 56.85% of the patients who reported that their hyperglycemic events had increased during the pandemic, while some 31.58% reported that there were no differences in the number of hyperglycemic events prior and during the pandemic. This indicates that 56.85% of the patients were unable to manage and control their blood glucose levels within healthy ranges. This increase in the number of hyperglycemic events indicates the ineffectiveness of the patients to manage their diabetes due to the indirect challenges caused by the COVID-19 pandemic.

5.2.3 Diabetes Management:

The COVID-19 pandemic led the national government to impose an extensive lockdown measure that restricts movements of people. This restriction led to shortages in resources which includes diabetic medications and devices which makes it difficult for diabetic patients, who are considered as “collateral victims”, to access proper diabetic care during the pandemic and thus negatively impacts their diabetes management (Arcellana & Jimeno, 2020). About 43.16% of the patients reported an average performance in managing their diabetes, while a significant 41.84% of them reported not managing their diabetes very effectively. The set restrictions and lockdowns is the likely cause of the negative performance of the patients with regards to diabetes management

Table.4. Patient’s assessment on their ability to manage diabetes

| Ability to manage diabetes | f | % |
|-----------------------------------|------------|-------------|
| Very effectively | 9 | 2.37% |
| Effectively | 46 | 12.11% |
| Average | 164 | 43.16% |
| Not very effectively | 159 | 41.84% |
| Not effectively at all | 2 | 0.53% |
| Total | 380 | 100% |

5.2.4 Weight Changes and Physical activity:

Some 25.26% of the patients had their body weight maintained while 42.37% had lost weight, and 32.37% had regained body weight.

Moreover, 69.74% of the patients did not deliberately lose weight. It can be inferred that the weight change is unintentional; this points to less physical activity (66.05%) and mismanagement (Table 3) of the patients’ diabetes which are the main factors for the weight change.

Table.5. Variations in weight and physical activity

| Gained or lost weight | f | % | Deliberate weight change | f | % |
|--------------------------------------|------------|-------------|---------------------------------|------------|-------------|
| I have lost weight | 161 | 42.37% | Yes | 45 | 11.84% |
| My weight has remained stable | 96 | 25.26% | No | 265 | 69.74% |
| I have gained weight | 123 | 32.37% | Not applicable | 70 | 18.42% |
| Total | 380 | 100% | Total | 380 | 100% |
| Physical Activity Levels | f | % | | | |
| Less active than usual | 251 | 66.05% | | | |
| The same amount of activity as usual | 86 | 22.63% | | | |
| More active than usual | 43 | 11.32% | | | |
| Total | 380 | 100% | | | |

5.2.5 Patient’s appetite during the pandemic:

The table lays out the patients’ appetite during the pandemic. Table 6 states that 82.11% of the patients take 1-3 meals a day while 30.79% of the patients have increased appetite and 53.16% had their usual appetite. This points to mismanagement of diabetes because even with normal appetite, it is not enough to manage their diabetes. Additionally, this is due to less physical activity (Table 5) during the COVID-19 pandemic.

Table.6. Satiety of the patients

| Frequency of meals | f | % | Appetite during the pandemic | f | % |
|---------------------------|------------|-------------|-------------------------------------|------------|-------------|
| 1-3 Meals | 312 | 82.11% | Increase | 117 | 30.79% |
| 4-6 Meals | 66 | 17.37% | Normal | 202 | 53.16% |
| More than 6 meals | 2 | 0.53% | Decreased | 61 | 16.05% |
| Total | 380 | 100% | Total | 380 | 100% |

5.2.6 Diet:

Based on the findings at Table 7, 71.32% of the patients are resorting to healthy eating as their food planning method. Patients who have been imposed diet restrictions followed a

low calorie diet for 35.00% of the population and 20.53% followed a low cholesterol diet.

Table.7. Patient’s food lifestyle choices

| Food planning method to use | f | % | Diet restrictions to follow | f | % |
|-----------------------------|------------|-------------|-----------------------------|------------|---------------|
| Calorie Counting | 45 | 11.84% | Yes | 313 | 82.37% |
| Carbohydrate Counting | 30 | 7.89% | High fiber | 23 | 6.05% |
| Healthy Eating | 271 | 71.32% | Low Calorie | 133 | 35.00% |
| Using the Food Pyramid | 9 | 2.37% | Low Cholesterol | 78 | 20.53% |
| Other | 4 | 1.05% | Low fat | 14 | 3.68% |
| None | 20 | 5.26% | Low Protein | 5 | 1.32% |
| Not applicable | 1 | 0.26% | Low Salt/Sodium | 41 | 10.79% |
| Total | 380 | 100% | Not applicable | 12 | 3.16% |
| | | | Other | 7 | 1.84% |
| | | | No | 67 | 17.63% |
| | | | Total | 380 | 100% |

From this table, it is evident that the patients were not able to properly follow their diet restrictions and food planning methods. Based on the data below, 41.32% of the patients have a difficult time and 22.63% find it ‘very difficult’ to follow their diet restrictions. Similar to that, it is hard for 46.58% of patients to stick to their dietary planning methods.

Table.8. Subjective review of how well the patients follow their diet regime

| Difficulty of following diet restrictions | f | % | Difficulty of following food planning methods | f | % |
|---|------------|-------------|---|------------|-------------|
| Not at all difficult | 12 | 3.16% | Not at all difficult | 9 | 2.37% |
| Not very difficult | 43 | 11.32% | Not very difficult | 43 | 11.32% |
| Not easy not difficult | 72 | 18.95% | Not easy not difficult | 57 | 15.00% |
| Difficult | 157 | 41.32% | Difficult | 177 | 46.58% |
| Very difficult | 86 | 22.63% | Very difficult | 81 | 21.32% |
| Not applicable | 10 | 2.63% | Not applicable | 13 | 3.42% |
| Total | 380 | 100% | Total | 380 | 100% |

5.2.7 Food intake frequency of the Patients:

Based on this graph, the patients were not able to follow their

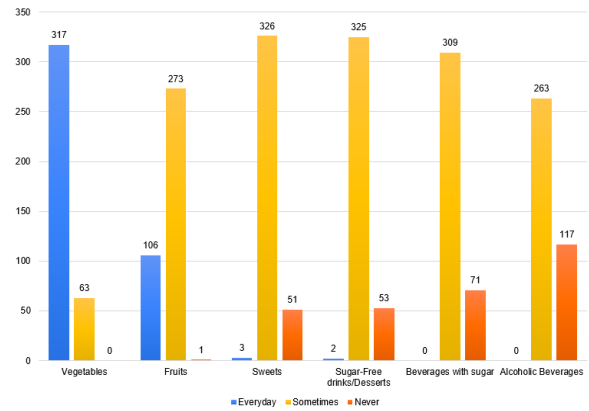


Fig.1. Food intake frequency of the Patients food planning method since most of the patients answered ‘Sometimes’ for the following: Sweets (85.79%), Beverages with sugar (81.32%), and Alcoholic beverages (68.95%).

5.2.8 Diabetes Medication of the Patients:

Table.9. Diabetes Treatment Taken by the Patients

| Ability to Follow Diabetes Regimen | f | % |
|------------------------------------|------------|-------------|
| Less able than usual | 184 | 48.42% |
| Same as usual | 168 | 44.21% |
| More able than usual | 17 | 4.47% |
| Not applicable | 11 | 2.89% |
| Total | 380 | 100% |

This table displays the medication taken by the patients to treat their diabetes. The majority of the patients (57.11%) treat their diabetes through control of diet and oral medication, while diet-controlled treatment is used by 28.42% of the total patients. It also shows that 6.58% of the patients use oral medication only to treat their diabetes while 2.89% of the patients combine it with control of diet and insulin. A combination of oral medication and insulin is used by 2.11% of the patients, and a total of 1.32% treat their diabetes through control of diet and insulin. Lastly, 1.05% of the patients only use insulin as their diabetes treatments.

The table also shows that 4.74% of the patients use the syringe injections to take their insulin, while 2.37% use insulin pen device(s), and 0.26% of the patients use an insulin pump. Majority of the patients (92.37%) answered not applicable since they do not use insulin as their diabetic medication.

As stated in chapter 2, it is important for diabetic patients to have good glycemic control to prevent uncontrolled levels of blood sugar. Oral medications, insulin, and diet-controlled are utilized by the patients as their treatment. Patients with Type 1

diabetes mellitus are highly dependent on exogenous insulin since they do not produce insulin. The lower prevalence of individuals with Type 1 diabetes mellitus as compared to those with type 2 diabetes mellitus explains the low frequency of those who use insulin as a treatment.

5.2.9 Patients' Ability to Follow their Diabetes Regimen:

Table.10. The Ability of the Patients to Follow Their Diabetes Regimen

| Ability to Follow Diabetes Regimen | f | % |
|------------------------------------|------------|-------------|
| Less able than usual | 184 | 48.42% |
| Same as usual | 168 | 44.21% |
| More able than usual | 17 | 4.47% |
| Not applicable | 11 | 2.89% |
| Total | 380 | 100% |

This table displays the ability of diabetes patients to follow their diabetes regimen which includes blood glucose testing and taking their medication as prescribed during the COVID-19 pandemic. It shows that 48.24% of the patients were less able to follow their diabetes regimen as usual, while 44.21% of the patients reported that they were able to follow their diabetes regimen the same as prior to the pandemic. The data also shows that 4.47% of the total patients were more able to follow their diabetes regimen than usual. This shows that the majority of the patients were less able to follow their regimen, hence, they are not able to manage their diabetes well.

Table.11. Patients' Stockpiling of Diabetes Medications and Equipment

| Stockpiling Diabetes Medications and Equipment More than Usual | f | % |
|--|------------|-------------|
| Yes | 88 | 23.16% |
| No | 289 | 76.05% |
| Not applicable | 3 | 0.79% |
| Total | 380 | 100% |

This table presents the patients who stockpiled diabetes medications and equipment during the COVID-19 pandemic. Out of 380 patients, 289 (76.05%) patients did not stockpile medications and equipment and only 88 patients (23.16%) stockpiled diabetic medications and equipment. Considering that diabetic patients are high-risk to contracting COVID-19, they are unable to leave the house to go buy their medications,

and equipment. There are also issues in the availability of the medications and equipment that pose a barrier for the patients.

5.2.10 Advice from Health professionals:

Table.12. Communication with the healthcare team Advice from health care

| Advice from health care | f | % | Proactive medical care advice | f | % |
|-------------------------|------------|-------------|-------------------------------|------------|-------------|
| No | 168 | 44.21% | No | 152 | 40.00% |
| Not applicable | 6 | 1.58% | Not applicable | 97 | 25.53% |
| Yes | 206 | 54.21% | Yes | 131 | 34.47% |
| Total | 380 | 100% | Total | 380 | 100% |

This table shows 54.21% of the patients received advice from healthcare professionals to manage their condition during the COVID-19 outbreak. However, 44.21% of the patients were reported to have not received advice from healthcare professionals. This indicates that there is still a significant number of patients who were unable to receive advice from healthcare professionals which may lead to them being unable to manage their blood glucose levels. Due to the lack of advice from healthcare professionals, the patients may rely on information they just read on the Internet, preexisting knowledge, and even superstitious beliefs which may lead to mismanagement of diabetes.

This table also displays that the majority of the patients (40%) were reported to have not been contacted proactively by their physicians while 34.47% of the patients reported that their physicians proactively reached out. This is likely due to the doctor-to-patient ratio of 1:33,000 in the Philippines which makes reaching out to patients challenging especially during the COVID-19 pandemic (Sandoval, 2016). As stated in Chapter 2, the World Health Organization (WHO) recommends one doctor for every 10,000 patients which makes the doctor-to-patient ratio of the Philippines significantly lower and this may influence the quality of health services in the country.

5.2.11 Check-ups and consultations:

Table.13. Diabetes-related consultations during COVID-19

| Diabetes-related consultations during COVID-19 | f | % |
|--|-----|--------|
| No | 109 | 28.68% |
| Not applicable | 14 | 3.68% |
| Yes, face to face | 234 | 61.58% |

| | | |
|------------------------------------|------------|-------------|
| Yes, virtually (telephone, online) | 23 | 6.05% |
| Total | 380 | 100% |

This table shows that the majority of the patients attended face to face diabetes-related consultations during COVID-19, comprising 61.58% of the population. However, a significant group of patients, constituting 28.68% of the population reported to have not attended any diabetes-related consultations during COVID-19. This is probably due to the fear of contracting the virus causing COVID-19, hence, 6.05% of the patients opt for virtual diabetes-related consultations. In addition, 3.68% of the patients said that diabetes-related consultations during COVID-19 were not applicable to them.

Table.14. Virtual Diabetes Consultation during COVID-19

| Attended any virtual diabetes consultation during COVID-19 | f | % | If you attended virtual diabetes consultation | f | % |
|--|------------|-------------|---|------------|-------------|
| No, I preferred to attend face-to-face consultations, although remote consultations were available | 35 | 9.21% | I attended my diabetes consultations by phone | 10 | 2.63% |
| No, these were not available during COVID-19 | 229 | 60.26% | I attended my diabetes consultations via an online platform | 9 | 2.37% |
| Not applicable | 96 | 25.26% | I attended my diabetes consultations via email | 2 | 0.53% |
| Yes, I attended a few | 18 | 4.74% | Not applicable | 357 | 93.95% |
| Yes, I attended them regularly | 2 | 0.53% | Others | 2 | 0.53% |
| Total | 380 | 100% | Total | 380 | 100% |
| Rating Virtual Diabetes | | | | | |

| Consultations | f | % |
|----------------------|-----------|-------------|
| Not at all helpful | 1 | 2.44% |
| Not very helpful | 1 | 2.44% |
| Slightly helpful | 11 | 26.83% |
| Helpful | 14 | 34.15% |
| Very helpful | 14 | 34.15% |
| Total | 41 | 100% |

This table shows that 60.26% of the patients did not attend any virtual diabetes consultation during COVID-19, while 25.26% said that it is not applicable to them and 9.21% preferred attending face-to-face consultations even though remote consultations were available. However, a small proportion of the population still opt for virtual diabetes consultation wherein 4.74% of the patients attended few appointments virtually and 0.53% of the patients attended them regularly. These virtual diabetes consultations were conducted via phone, online platforms, or email. It was reported that 93.95% of the patients were “Not applicable” because they did not attend virtual diabetes consultations, 2.63% attended by phone, 2.37% attended via online platforms, and 0.53% attended via email.

This table also shows the patients' rating on virtual diabetic consultations, applicable only to those who have attended. Out of the three hundred eighty (380) patients, only 10.79% of the population attended virtual diabetes consultations.

The virtual diabetes consultations were perceived to be helpful by 34.15%, very helpful by 34.15% and slightly helpful by 26.83%. However, 2.44% of the patients did not find them very helpful and 2.44% did not find them helpful at all. Since the majority of the population perceived them as helpful and very helpful, virtual diabetes consultations are therefore helpful in diabetes management.

Table.15. Appointed schedule of daily management of diabetes care and screening of diabetes complications appointed schedule of daily management of diabetes care

| Appointed schedule of daily management of diabetes care | f | % | Appointed schedule of screening of diabetes complications | f | % |
|--|----------|----------|--|----------|----------|
| Appointment brought | 17 | 4.47% | Appointment brought forward | 14 | 3.68% |

| | | | | | |
|---|------------|-------------|---|------------|-------------|
| forward | | | | | |
| Appointment cancelled by your care provider | 4 | 1.05% | Appointment cancelled by your care provider | 4 | 1.05% |
| Appointment rescheduled | 144 | 37.89% | Appointment rescheduled | 87 | 22.89% |
| Face-to-face appointment transformed into a virtual one | 13 | 3.42% | Face-to-face appointment transformed into a virtual one | 5 | 1.32% |
| I did not attend my appointment | 105 | 27.63% | I did not attend my appointment | 71 | 18.68% |
| No disruptions | 26 | 6.84% | No disruptions | 32 | 8.42% |
| Not applicable | 71 | 18.68% | Not applicable | 165 | 43.42% |
| Total | 380 | 100% | Others | 2 | 0.53% |
| | | | Total | 380 | 100% |

According to the data presented above, the majority of the patients comprising 37.89% of the population, reported that their appointments for daily management of diabetes care was rescheduled while 27.63% of the patients reported that they did not attend their appointments.

With regards to the appointment for screening of diabetes complications, 43.42% of the patients said it is not applicable to them while 22.89% of the patients reported that they have their appointment rescheduled. Rescheduled appointments may be due to the restrictions that limit face to face contact with other people as a way to reduce the spread of the COVID-19 virus while people not attending their respective appointments may be due to the fear of contracting the COVID-19 virus.

5.2.12 Patient's access to multidisciplinary care:

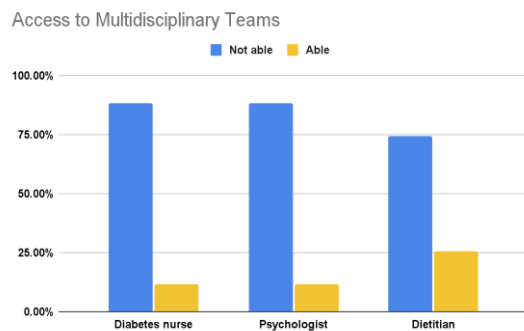


Fig.2. Access to multidisciplinary specialists during the pandemic

A great number of the patients were not able to access their multidisciplinary teams. At least three-fourths of them were not able to access all of the three specialists. The majority of the patients who were categorized to be unable to access their teams did not require/did not seek the help of these three. Some 66.84% on the diabetes nurse, 67.89% on the psychologist, and 58.42% on the dietitian were reported to be “Not applicable” or the patients did not opt to have a consultation with these specialists.

5.2.13. Patient's review on their ability to manage diabetes complications:

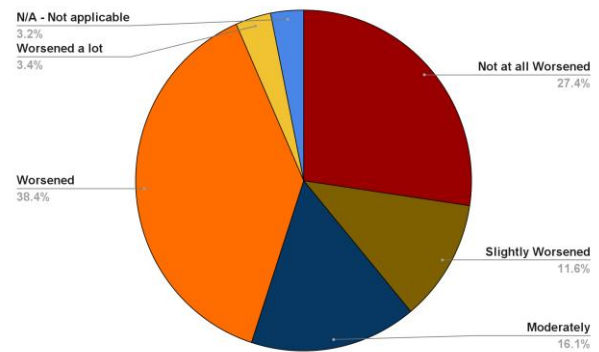


Fig.3. Rating on their management of diabetes complications during the pandemic

About 69.47% of the patients felt that their management of diabetes complications worsened to a certain degree, brought about by the difficulties in diabetes care during the COVID-19 pandemic. A majority of the total patients, about 38.4%, reported that their management of their complications had worsened, while 27.37% felt that they managed their diabetes complications relatively well.

5.2.14. Outpatient Care:

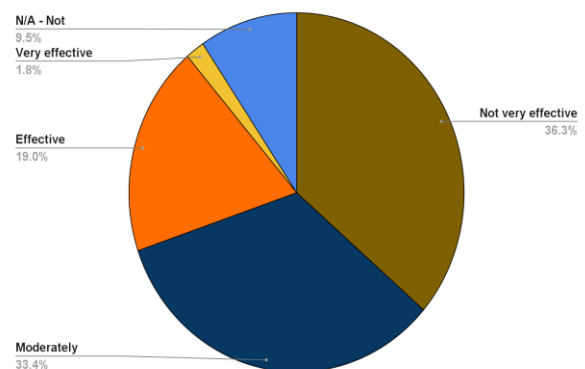


Fig.4. Patient's report on the effectivity of their outpatient care

About 54% of the patients reported that their outpatient care was effective to a certain degree. Some 36.32% of the total patients, which makes the majority, reported that their outpatient care was not very effective and quite a similar proportion, 33.42%, reported to have moderately effective outpatient care. None of the patients reported that their outpatient care is not at all effective. Overall, a significant proportion of the patients had a negative experience with their outpatient care.

5.2.15. Guidance given for people living with diabetes:

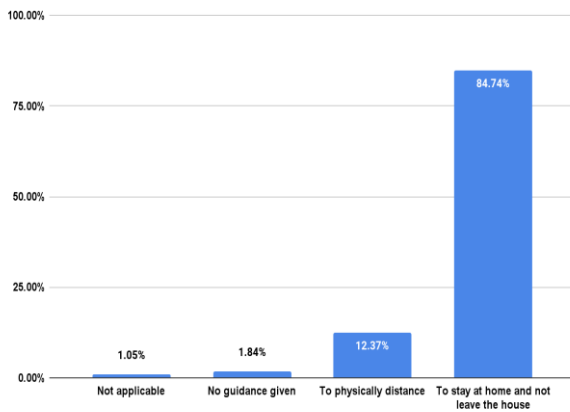


Fig.5. Guidance given by the National Government during the pandemic

About 96% of the patients reported that they received guidance from the government. An overwhelming majority of the total patients (84.74%) reported that the most common guidance given to them was to stay at home. This stay at home order is an advice given to the general public as a way to reduce transmissions of the coronavirus rather than a specific advice given to a susceptible group. The next common advice given was to physically distance, which makes 12.37% of the total patients while 1.84% reported to receive no guidance at all.

5.3. Challenges on Diabetes Care and Management

This section discusses the access of the patients to diabetes medications and/or supplies. It discusses the findings on possible shortages and the barriers encountered by the patients in accessing their diabetes medications, supplies, and equipment. This section also discusses the barriers to accessing diabetes care, management of diabetic complications, and government response.

5.3.1 Availability of Medications, Supplies and Technologies: Table.16. the Patients Who are Worried on Possible Shortages of Diabetes Medications, Supplies, and Technologies

| Worry about Possible Shortages | f | % |
|--------------------------------|------------|-------------|
| Not at all worried | 18 | 4.74% |
| Not very worried | 33 | 8.68% |
| Slightly worried | 34 | 8.95% |
| Worried | 99 | 26.05% |
| Very worried | 194 | 51.05% |
| Not applicable | 2 | 0.53% |
| Total | 380 | 100% |

This table shows the patients who are worried about possible shortages of medications, supplies, and technologies. Majority of the patients (51.05%) are very worried about possible shortages, while 26.05% of the patients are worried. 8.95% of the patients are slightly worried about the possible shortages, and 8.68% are not very worried. Only 4.74% of the patients are not at all worried about the possible shortages. The restrictions caused by the pandemic which affected the supply of diabetes medication, supplies, and equipment caused the patients to feel very worried about possible shortages.

5.3.2. Patients' Difficulty in Access to Diabetes Medications, Food Supplies, and Equipment:

Table.17. Difficulty in Access to Diabetes Medications, Food Supplies, and Equipment

| Difficulty in Accessing Diabetes Medications | f | % | Difficulty in Accessing Diabetes Equipment | f | % |
|---|------------|-------------|--|------------|-------------|
| Not at all difficult | 7 | 1.84% | Not at all difficult | 14 | 3.68% |
| Not very difficult | 24 | 6.32% | Not very difficult | 23 | 6.05% |
| Not easy nor difficult | 54 | 14.21% | Not easy nor difficult | 25 | 6.58% |
| Difficult | 188 | 49.47% | Difficult | 185 | 48.68% |
| Very difficult | 104 | 27.37% | Very difficult | 114 | 30.00% |
| Not applicable | 3 | 0.79% | Not applicable | 19 | 5.00% |
| Total | 380 | 100% | Total | 380 | 100% |
| Difficulty in Accessing Diabetes Food Supplies | f | % | | | |
| Not at all difficult | 11 | 2.89% | | | |

| | | |
|------------------------|------------|-------------|
| Not very difficult | 66 | 17.37% |
| Not easy nor difficult | 83 | 21.84% |
| Difficult | 143 | 37.63% |
| Very difficult | 73 | 19.21% |
| Not applicable | 4 | 1.05% |
| Total | 380 | 100% |

This table shows that 49.47% of the total patients find it difficult to access their diabetes medications during the COVID-19 pandemic, while 27.37% of the patients find it very difficult. In accessing diabetes equipment, 48.68% of the patients find it difficult, while 30.00% find it very difficult.

A total of 37.63% of the patients find it difficult to access diabetes food supplies, while 21.84% find it neither easy nor difficult. Majority of the patients have encountered barriers to accessing diabetes medications, supplies, and equipment as shown in figure.6, thus, the majority of the patients have difficulty in accessing the medications, supplies, and equipment that they need.

5.3.3. Perceived risk of contamination:

Table.18. Risk consideration in getting COVID-19 and its severe form

| Risk consideration in getting COVID-19 | f | % | Risk for severe form of COVID-19 | f | % |
|--|------------|-------------|----------------------------------|------------|-------------|
| High risk | 101 | 26.58% | High risk | 84 | 22.11% |
| Low risk | 7 | 1.84% | Low risk | 28 | 7.37% |
| Moderate risk | 29 | 7.63% | Moderate risk | 27 | 7.11% |
| No risk | 1 | 0.26% | No risk | 4 | 1.05% |
| Not applicable | 1 | 0.26% | Not applicable | 2 | 0.53% |
| Very high risk | 241 | 63.42% | Very high risk | 235 | 61.84% |
| Total | 380 | 100% | Total | 380 | 100% |

This table assesses the patients’ level of awareness whether they considered themselves at high risk during the COVID-19 outbreak. It shows that 63.42% of the patients considered themselves at very high risk and 26.58% of the patients considered themselves at high risk of getting COVID-19. Relating to the risk of developing a severe form of COVID-19, 61.84% of the patients believed the risk to be very high and 22.11% of the patients believed the risk to be high. Hence, the patients were aware that they are at risk of getting COVID-19 and developing its severe form.

5.3.4. Biggest Barriers to Accessing Diabetes Medications, Supplies, and Equipment’s

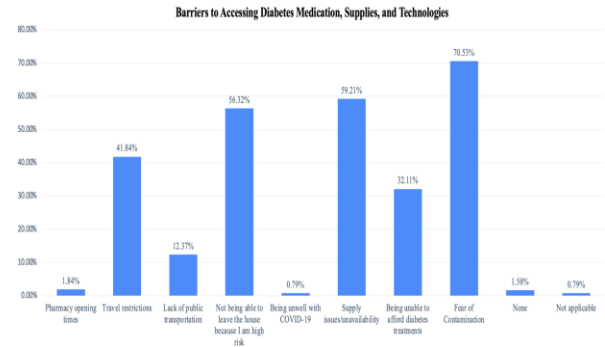


Fig.6. Biggest Barriers to Accessing Diabetes Medications/Supplies/Technologies

Figure.6. presents the results of the patients who were asked about the top three barriers they encountered accessing diabetes medications, supplies, and equipment. A majority of 70.53% of the total patients reported that “fear of contamination” as the biggest barrier to accessing diabetes medication, supplies and equipment. As stated by Arcellano & Jimeno (2020), diabetic patients are high-risk individuals because of their compromised innate immunity. Hence, they consider the fear of contracting the COVID-19 pandemic as their biggest barrier in accessing the medications, supplies, and technologies that they need. The next barrier encountered by 59.21% of the patients is supply issues or unavailability. In chapter 2, it is stated that the lockdown measures imposed in the country caused interruptions in the manufacturing and delivery of drugs, resulting in unavailability, thus, the majority of the patients considered this as a barrier. A total of 56.32% of the patients reported that “not being able to leave the house to go and get the medication, etc. because I am at high risk” as a barrier to their access to medications, supplies, and technologies. Diabetic patients are part of the vulnerable population or at high-risk of contracting the virus so they are unable to leave the house.

Aside from the top three biggest barriers to accessing diabetes medications, supplies, and equipment, 41.84% of the patients answered “travel restriction” as a barrier. Due to the community quarantine imposed by the IATF, travel restrictions have been implemented. 32.11% of the patients considered being unable to afford diabetes treatments as a barrier, while 12.37% answered “lack of public transportation. The opening time of pharmacy is considered by 1.84% of the patients as a barrier, while 0.79% of the patients reported being unwell with COVID-19 as a barrier. Only 1.58% of the total patients did not

have any barriers in accessing diabetes medications, supplies, and technologies.

5.3.5. Biggest barriers to accessing diabetes care

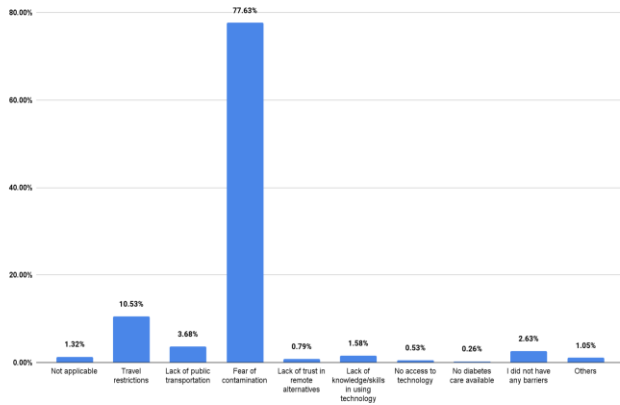


Fig.7. Biggest barriers during the COVID-19 pandemic

The great majority of the patients (96%) had experienced some type of barrier in accessing proper diabetic care during the pandemic. About 77.63% of the total patients reported that “Fear of contamination” was the biggest barrier to their access to diabetic care. The next significant barrier among the patients would be the travel restrictions, which was reported by 10.63% of the total patients. The rest of the barriers are not of great significance as they do not represent much of the barriers for access to diabetes care.

5.4 Correlation Analysis

Pearson’s correlation was used to evaluate the relationship between the independent variable and the dependent variable. The challenges faced by the patients were considered as the independent variable while the status on diabetic care was the dependent variable. The strength of the relationship of the variables is measured by Pearson’s correlation coefficient (r).

Table.19. Strength of linear relationship

| r value | Strength |
|--------------|-------------------|
| At least 0.8 | Very strong |
| 0.6 - 0.8 | Moderately strong |
| 0.3 - 0.5 | Fair |
| 0 - 0.3 | Poor |

The r value ranges from -1 to 1; in which a value of -1 indicates a perfect negative correlation, 1 as a perfect positive correlation, and 0 indicates no relationship between the variables. The table above shows the strength of the relationship

corresponding to the value of the correlation coefficient as provided by Chan, YH (2003).

Table.20. Correlation between challenges faced and the status on diabetes care

| | | |
|------------------|---------------------|-------------------------|
| | | Status on Diabetes Care |
| Challenges Faced | Pearson Correlation | 0.41 |

There is a fair strength relationship between the challenges faced by the patients during COVID-19 and their status on diabetes care (r=0.41). The analysis supports that the challenges faced have a positive correlation to their status on diabetes care. This points that both of the variables are related, however the strength of that relationship is not that strong. Some patients may have a decent status on their diabetes care and management, regardless of the challenges they faced. Nonetheless, the challenges during the COVID-19 pandemic affects the patient’s status on diabetes care.

The results support the argument that the patients’ status of diabetes care and management was affected by their profile and challenges they faced during the COVID-19 pandemic. Therefore, the null hypothesis should be rejected and the alternative hypothesis should be accepted.

VI. CONCLUSION

This chapter brings together the results presented within the previous chapter, indicating the summary and the findings, the conclusions drawn from the findings and recommendations made by the researchers. Moreover, the importance of the study is completely stressed out.

6.1. Summary of Findings

A descriptive correlational design was used for the study, wherein the patients who underwent purposive sampling consisted of 380 diabetic patients, aged 18-59 years old, from NCR. In order for the researchers to gather data, they used an online survey-questionnaire. For the statistical analysis of the data gathered, they used frequency and percentage. This study was done to determine the challenges faced by patients who have diabetes in obtaining quality diabetes care and management during the COVID-19 pandemic. It also highlighted the status of and challenges on diabetes care and management, and their relationship with the patients’ profile. The data gathered from the responses of the diabetic patients led to significant findings.

In terms of their demographic profile, 229 out of 380 or 60.26% of the patients were female while 151 out of 380 or 39.74% were male. Meanwhile, out of 380 patients, there were 191 or 50.26% who were employed and working from home, 56 or 14.74% were employed at their usual place at work, 55 or 14.47% were self-employed and working from home, 31 or 8.16% were househusbands/housewives, 23 or 6.05% were retired, 11 or 2.89% were unemployed, 7 or 1.84% were students, 4 or 1.05% were temporarily not working because of COVID-19 but were still employed, and 2 or 0.53% had other answers. Moreover, their average monthly income showed that 131 out of 380 or 34.47% belong to the lower middle income class, 117 out of 380 or 30.79% belong to the low-income class but were not considered poor, 71 or 18.68% preferred not to answer, 44 or 11.58% belong to the middle income class, 9 or 2.37% belong to the poor income class, 4 or 1.05% belong to the upper middle income class, and another 4 or 1.05% belong to the upper middle income but were not considered rich.

With regards to their status on diabetes care and management, 164 out of 380 or 43.16% said that they have an average ability to manage their diabetes during the COVID-19 pandemic. Moreover, a significant number of patients consisting of 159 out of 380 or 41.84% said that they were not effectively managing their disease. Furthermore, out of 380 patients, 46 or 12.11% said that they were effectively managing their diabetes, 9 or 2.37% said that they were managing their diabetes very effectively, and 2 or 0.53% said that they were managing their disease not effectively at all.

When it comes to the challenges faced by patients on diabetes care and management, there were 157 out of 380 or 41.32% of the patients who claimed that they find it difficult to follow diet restrictions, 86 out of 380 or 22.63% said it was very difficult for them, 72 out of 380 or 18.95% stated that it was not easy nor difficult for them, 43 out of 380 or 11.32% said it was not very difficult for them, 12 out of 380 or 3.16% claimed that it was not at all difficult for them, and 10 out of 380 or 2.63% said that following diet restrictions was not applicable for them. In line with this, 177 out of 380 or 46.58% of the patients stated that they find it difficult to follow their food planning methods, 81 out of 380 or 21.32% find it very difficult, 57 out of 380 or 15.00% find it neither easy nor difficult, 43 out of 380 or 11.32% find it not very difficult, 13 out of 380 or 3.42% said that following food planning methods was not applicable for them, and 9 out of 380 or 2.37% said that following food planning methods was not at all difficult for them.

Furthermore, 188 out of 380 or 49.47% of the patients declared that they find it difficult to access diabetes medication, 104 out of 380 or 27.37% of the patients find it very difficult, 54 out of 380 or 14.21% of the patients said it was neither easy nor difficult, 24 out of 380 or 6.32% of the patients find it not very difficult, 7 out of 380 or 1.84% of the patients said it was not at all difficult, while 3 out of 380 or 0.79% declared that accessing diabetes medication was not applicable for them. Meanwhile, 143 out of 380 or 37.63% of the patients said that they find it difficult to access diabetes food supplies, 83 out of 380 or 21.84% of the patients said it was neither easy nor difficult, 73 out of 380 or 19.21% find it to be very difficult, 66 out of 380 or 17.37% find it not very difficult, 11 out of 380 or 2.89% said it was not all difficult, while 4 out of 380 or 1.05% stated that accessing diabetes food supplies was not applicable to them. In addition to this, 185 out of 380 or 48.68% of the patients claimed that they find it difficult to access diabetes equipment, 114 out of 380 or 30.00% of the patients find it very difficult, 25 out of 380 or 6.58% said it was neither easy nor difficult, 23 out of 380 or 6.05% of the patients said it was not very difficult for them, 19 out of 380 or 5.00% of the patients stated that accessing diabetes equipment was not applicable to them, while 14 out of 380 or 3.68% of the patients said it was not at all difficult.

When the patients were asked about their top three biggest barriers to accessing diabetes medication, supplies, and technologies during the COVID-19 pandemic, 268 out of 380 or 70.53% answered fear of contamination, 225 out of 380 or 59.21% went for supply issues, 214 out of 380 or 56.32% voted for not being able to leave, 159 out of 380 or 41.84% said it was travel restrictions, 122 out of 380 or 32.11% answered for being unable to afford, 47 out of 380 or 12.37% stated that it was the lack of public transportation, 7 out of 380 or 1.84% said it was the pharmacy opening times, 6 out of 380 or 1.58% declared that they faced no barrier to accessing diabetes medication, supplies, and technologies, 3 out of 380 or 0.79% claimed that it was being unwell with COVID-19, and 3 out of 380 or 0.79% said this was not applicable to them.

5.2. Conclusion

Based on the findings gathered, the following conclusions have been derived.

- Most of the patients of the study were females. Most of the patients were employed, with the majority of those working from home. The gross monthly family incomes were generally low among the patients as most of them

belong to the lower middle income bracket and below. This low family income may be attributed to the negative effects of the pandemic on businesses as well as employment since most establishments and agencies use a skeleton workforce as a risk management procedure to reduce the chances of infection among their employees.

- An unstable or more variable blood glucose readings were seen among most of the patients during the pandemic. These unstable readings are indicative of poor diabetes management during the COVID-19 pandemic as it is seen that most of the patients are experiencing more hyperglycemic events compared prior to the pandemic. Moreover, the patients described their status of diabetes care and management during the COVID-19 pandemic as not effective. This poor rating may be attributed to the challenges faced by these patients.
- The data gathered presented that the biggest challenges faced by the patients are fear of contamination, supply issues, and not being able to leave because of high risk. As a result of these three, they also find it difficult to access their diabetes medicines and equipment, as well as their diabetes food supplies as most of them had experienced difficulties in following their strict diet and food planning methods.
- Based on these findings, the study failed to accept the null hypothesis that the patients' status of diabetes care and management was not affected by their profile and challenges they faced during the COVID-19 pandemic. There was evidence to suggest that the patient's social status and the challenges they faced during the pandemic, have an effect on their diabetes care and management.

Recommendations:

After the study has gone through refinement and apprehension, the researchers came up with these highly significant recommendations.

- For Future Researchers. The study mainly focused on diabetes care and management in NCR during the COVID-19 pandemic. Thus, it is recommended that future studies will look into diabetes care and management in other regions of the country. Future researchers could apply a comparison and contrast method in their investigations, comparing the data

gathered from this study to data collected in another setting to point out the similarities and differences in diabetes care and management among different regions during the COVID-19 pandemic. Meanwhile, due to the COVID restrictions raised by IATF, the researchers were not able to directly collaborate with authorities and purely relied on secondary data with respect to the total population of diabetic patients in NCR. Therefore, future researchers are recommended to collaborate with authorities such as certain health institutions, Nongovernment Organizations (NGOs) and Local Government Units for more accurate and up-to-date data.

- For the Government and Healthcare Providers. Based on the challenges faced by the patients and their status of diabetes care and management, the researchers highly recommend the government to focus on innovation, virtualization, and digitalization of healthcare systems in the country. This shall be done in a way that is more accessible to the general public considering the limitations of the patients during the pandemic. This will help the patients continue the monitoring of their disease with a health professional even at the comfort of their home. Moreover, healthcare providers can show up in television or radio advertisements or even in social media platforms to raise awareness on the possible changes in healthcare delivery in the country. This will help reach more people who need medical assistance and, in turn, will improve the care and management of the disease.
- For Diabetic Patients and the General Public. Reducing the incidence of diabetes must be one of the focuses of both the national health department and local health units to improve the health of the general population. Achieving this results in fewer comorbidities and helps ease burden on hospitals in terms of manpower and expenditures in the case of another pandemic. This may be achieved through interventions such as educating and bringing awareness to the general public about diabetes and its complications, initiating policies and programs that promote living a healthy lifestyle, and providing accessible screening for pre-diabetic patients. Those already with diabetes must be mindful of their lifestyle choices to better manage their disease, as well as reduce their chances of developing complications. They should be well aware of their needs by constantly monitoring their condition and

making trips to their health center for general examination to improve their health outcome.

- There was evidence to suggest that the patient's social status and the challenges they faced during the pandemic, have an effect on their diabetes care and management. Most of the patients of the study were females. Most were employed, with the majority of those working from home. The gross monthly family incomes were generally low among the patients as most of them belong to the lower middle income bracket and below. This low family income may be attributed to the negative effects of the pandemic on businesses as well as employment since most establishments and agencies use a skeleton workforce as a risk management procedure to reduce the chances of infection among their employees. An unstable or more variable blood glucose readings were seen among most of the patients during the pandemic. These unstable readings are indicative of poor diabetes management during the COVID-19 pandemic as it is seen that most of the patients are experiencing more hyperglycemic events compared prior to the pandemic. The biggest challenges faced by the patients are fear of contamination, supply issues, and not being able to leave because of high risk. As a result of these three, they also find it difficult to access their diabetes medicines and equipment, as well as their diabetes food supplies as most of them had experienced difficulties in following their strict diet and food planning methods.

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