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Self-Prescribed Pharmacological Drugs Used for Covid-19 Prevention and Treatment in the Current Pandemic

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Abstract

The practice of using pharmacological drugs not prescribed by qualified medical practitioners is a worrying trend especially in the ongoing Covid-19 pandemic. It is a global issue that has attracted the attention of physicians and various stakeholders in the health care systems in developing and developed countries. Such practice is associated with overdosage, allergic reaction, infection resistant to antibiotic, wrong diagnosis, delay in seeking treatment at health facilities and drug addiction. This study assessed the prevalence of self-prescribed antibiotics, analgesics, vitamins, and minerals by a cross section of burgesses in the Prices Town Regional Corporation (PTRC) in South Trinidad to treat and prevent Covid-19 infection. A descriptive cross-sectional survey in online and paper and pencil questionnaire formats was conducted from February 2022 to April 2022 on 286 self-selected participants from a population of 1000 residents. Data entry and analysis conducted after merging them using Google Charts. Prevalence of Ivermectin was 9.44%, Zithromax 3.15, Steroids 3.5% Panadol 33.6%, Vitamins C 63.3%, Zinc 60.8%, D3 55.2 %, and B Complex 11.9%. Multivariate analysis performed on dependent and independent variables showed that the use of self-prescribed medication was significantly associated with age group 26-35 years (COR 0.15, p0.00129, 95% CI 0.04, 0.51 at significance level of p≤0.05) and marital status of being separated from spouses (COR 2.48, p0.0229, 95% CI 1.02, 6.06, significance level of p≤0.05). More females practiced self-medication compared to males. The researcher recommends health education to curb the practice.

Keywords*: Prevalence, Treatment, Self-prescribed antimicrobials, Analgesic, Vitamins, Covid-19, Pandemic, Infection.*

Introduction

Use of medicinal products not prescribed by consumers on their own initiative and responsibility when considered appropriate as defined by the WHO (World Health Organization). The prevalence of self-medication with antibiotics during the early outbreak of Covid-19 was 88.33% [1] and only 179 (28.59%) took medication with doctors' advice. Findings revealed that the most frequently used anti-infective were ivermectin (77.15%), azithromycin (54.15%), doxycycline (40.25%).

The parallel health care system in the country regularly admitted patients with moderate to severe Covid-19 symptoms. Updates were given daily by the Ministry of Health. This increased the level of awareness as statistics was provided on the number of newly diagnosed individuals, number of deaths, the number of people who got vaccinated, those in home isolation and quarantine and those discharged from Covid-19 designated hospitals.

Vaccines were not available in the country until the first quarter of 2021. People therefore started seeking information on various measures that would prevent them from getting infected. Information spread quickly via social media,

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pharmacy outlets and places of work on the names of on-the-counter drugs commonly procured. This research study sought to find out from participants their level of engagement in the use of identified antibiotics, multivitamins, minerals, and analgesics.

The practice of self-prescribed drugs to prevent and treat covid-19 infection has become widespread in the rural and urban communities. The delay on the part of patients is due to many reasons and major among them is home treatment with self-medication that are prescribed or not prescribed. This is one of the causes of complications, high occupancy of high dependency unit beds and intensive care unit beds. All these contributed to high death rates reported daily by the authorities.

The current study design Hypothesis "use of self-prescribed antibiotics, analgesics, vitamins, and minerals is common during Covid-19 Pandemic "was tested by a descriptive cross-sectional study rather than analytical study. The ross sectional study done for descriptive study may be used to generate hypothesis, but an independent study must be done to prove them [2].

Pharmacological agents widely used to prevent and treat Covid-19 infection among sampled population in research studies in many countries are antimicrobials, analgesics, steroids, and vitamins.

In India, increasing number of people relies on self-prescribed drug during current pandemic lockdown [3]. The Covid-19 pandemic has given the practice of antibiotic use without recommendation by qualified health care giver a new impetus that is supported by social media platform [4]. Findings of a study done in Nigeria [5] showed an overall prevalence of 41 % for the use of prescribed and non-prescribed allopathic drugs in the prevention and treatment of Covid-19. Vitamin C, multivitamins and antibiotics were the main medications of choice by Nigerians with tertiary level of education. In a systemic review study [6]. Prevalence in four of the studies performed in the general ranged between <4% to 88.3% and in three conducted on specific populations the range was from 33.9% to 51.3%.

There is rampant use of antibiotics to treat covid-19. The trend is worrisome in that Covid-19 is a viral disease and only a few Covid-19 patients would have bacterial co-infection [7]. Findings of one study ([8] revealed that analgesics and anti-inflammatory drugs are the most self-medicated products, while vitamins and dietary supplements also appear to be frequently self-administered, but by older population. In 11 studies reviewed [9] evidence does not suggest azithromycin is an effective treatment for Covid-19, especially given the danger of antimicrobial resistance. Other medications used are Anti-parasitic (Ivermectin) and steroids (mainly prednisolone).

Prior experience, ready availability of non-prescription drugs [10] were reported by 385 out of 416 respondents surveyed at a location in Ethiopia. Low level of education, being single and young age are some of the factors influencing self-prescribed drug use in rural areas of Cartagena, Colombia [11]. In one study among adult Syrian population [12] self-medication was significantly associated with monthly income, age, and living place.

Some advantages of self-medication include the empowerment of users, facilitation of better use of healthcare providers' time, reduction of cost incurred in funding public healthcare program. It moves patients towards greater independence [13] in making decisions about treating mild ailments. Self-medication can facilitate access to medicines and reduce health care costs [14].

Disadvantages and harmful effects of self-medication include delayed and missed diagnosis and subsequent complications, treatment failure, economic loss, serious health hazards, potential drug dependency and adverse drug effects ranging from mild to life threating drug interaction and even fatal outcome. A recent meta-analysis [15] of 33 randomized clinical trials in older patients found behavioral

interventions had significant effects, and these interventions were more effective than educational interventions. Self-medication accounts for around 5 to 10 per cent of drug sales in France [16]. According to a study [17], dangerous antibiotic resistant bacteria have been observed with increasing frequency over the past several decades.

Zithromax) is an antibiotic in film coated tablets and powder suspension formula manufactured by Pfizer Laboratories [18]. It is used in Covid-19 complicated by secondary bacterial infection [9]. It is also used in children above the age of 2 years to treat ear infections, community-acquired pneumonia and infected throat or tonsils [19]. In a randomized trial that included 263 participants with SARS-CoV-2 infection [20] treatment with a single oral dose of azithromycin, 1.2 g, vs placebo resulted in self-reported absence of Covid-19 symptoms at day 14 in 50% vs 50%. This was not statistically significant by the investigators.

Doxycycline is not recommended for general use to treat Covid-19 positive patients. In one other study however, [21] suggestion was that due to its immunomodulatory, anti-inflammatory, cardio-protective and antiviral effects, it seems to be an ideal drug for patients with mild, moderate, and severe type of Covid-19.

Hydroxychloroquine HCQ sulphate or Chloroquine CQ was not favoured to be used to treat covid-19 in many countries. Two meta-analyses reported a high risk of mortality, with ORs of 2.2 and 3.0, and the two others found no association between HCQ and mortality [22]. Findings from two meta-analyses showed that HCQ with Azithromycin increased the risk of mortality, with similar ORs of 2.5. A multi-center and multi-specialist research study [23] did not observe statistically significant difference in treatment effect of chloroquine when stratifying by serum chloroquine concentrations. A Chinese study [24] involving more than 100 patients of Covid-19 found chloroquine superior to the control group in reducing symptom duration, exacerbation of pneumonia including radiological improvement and promoting virus-negative seroconversion without any severe side effects.

There are documented and confirmed reports of chloroquine effectiveness in the treatment of Covid-19 especially in India and Africa. Two small human studies have been conducted in India [25] with both HCQ and CQ in Covid-19 and they have shown significant improvement in some parameters in patients with Covid-19.

Ivermectin has been shown to inhibit replication of SARS-CoV-2 in cell cultures [26]. It is not approved for prevention or treatment of Covid-19 infection by the manufacturers. Ivermectin may be a clinically useful anti-inflammatory agent for late-stage Covid-19 [27]. In a study done in Lagos, Nigeria, 12mg IV regime of Ivermectin given twice a week may have superior efficacy over 6mg IV given twice a week, and certainly over the non-I V arm of the study in clinical management of SARS-COV2 [28]. In clinical practice, they are not routinely used to treat viral illness because of the risk of bleeding. NSAIDs are among the drugs commonly used in self-medication for Covid-19 [29].

They were discouraged for the treatment of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections, fearing that they could increase the risk of infection or the severity of SARS-CoV-2 [30]. A study showed that there is no evidence that NSAID use is associated with risk of increased severity or risks of adverse events in Covid-19 patients [31]. Meta-analysis data from a study [32] suggests that NSAIDs such as ibuprofen, aspirin and COX-2 inhibitor, can be used safely among patients positive to SARS-CoV-2. Meta-analysis of 3 studies with a total of 2414 patients with Covid-19 [33] revealed no difference in the hazard for the development of a fatal course of Covid-19 between NSAID users and non-NSAID users (pooled hazard ratio = 0.86; 95% confidence interval 0.49-1.51). It is therefore suggested that NSAIDs should not be avoided in

patients who are appropriately indicated during the Covid-19 pandemic. Acute ibuprofen use was found not to be associated with a higher risk of admission [34] compared to non-NSAID users (adjusted odds ratio OR 1.271; 95% CI 0.548–2.953).

Acetaminophen group of 'on-the-counter' brand (OTC) of drugs that includes Paracetamol and Panadol are widely used for fever, body aches and cold. They can be purchased over the counter and are widely used. Study showed that acetaminophen exposure was associated with worse outcomes [35]. It greatly enhanced the risk of Covid-19 exacerbation in these patients [36]. Using paracetamol at home to treat mild Covid-19 symptoms, particularly in older adults with comorbidity, greatly enhanced the risk of hospitalization for dyspnea from interstitial pneumonia, so increasing the huge concern of crowding the intensive care units [37].

Acetylsalicylic Acid (Aspirin) is pharmaceutical drug under generis name Acetylsalicylic acid used to reduce pain1,2 or inflammation. Although Aspirin has been suggested to be independently associated with reduced risk of mechanical ventilation, ICU (Intensive Care Unit) admission and in-hospital mortality of Covid-19, academic interpretation confirmed that low-dose aspirin is least likely to improve Covid-19 mortality through anticoagulation as was suggested [38]. It was found in one study that the use of aspirin was found to be significantly associated with a reduced risk of mortality among patients with Covid-19 [39] but the effect of aspirin on the incidence of thrombosis and bleeding in patients with Covid-19 could not be drawn definitively due to limited studies. The use of ATP (antiplatelet) agent, mainly aspirin for covid-19 patients [40] might improve clinical outcomes without increasing the risk of side effects such as bleeding (log-rank $p<0.01$, relative risk 0.79, 95% CI 0.70 to 0.94).

Cough medicine is used as an antitussive and expectorant. Traditional Persian Medicine (TPM), Functional Foods (FFs) are found to have Antitussive potential for Covid-19 Therapy [41]. Chinese herbal formulas including the lung-cleaning and toxicity-excluding (LCTE) soup have played an important role in treating the ongoing Covid-19 pandemic (caused by SARS-CoV-2) in China [42]. Expectorants can be considered as prophylactic and therapeutic agents in the cocktail therapy against Covid-19 [43].

Augmentin is among antibiotics used to treat Covid-19. Many studies of hospitalized patients with Covid-19 note the empirical use of antibiotics in patients [44]. Routine use of antibiotics in the management of confirmed Covid-19 infection is not supported [45] a proportion of Covid-19 patients have bacterial co-infection. Oxidative stress leads to chronic inflammation, a contributing factor in a wide array of chronic illnesses, such as heart disease, cancer, and mental decline [46]. In a study in 40 older adults [47], those who took 45 mg of zinc per day experienced greater reductions in inflammatory markers than a placebo group. It is estimated that around 2 billion people worldwide are deficient in zinc due to inadequate dietary intake [48]. Certain foods such as ready-to-eat breakfast cereals, snack bars and baking flours are fortified with zinc [49].

Vitamin B complex is water-soluble and composed of eight B vitamins namely B-1 (thiamine), B-2 (riboflavin), B-3 (niacin), B-5 (pantothenic acid), B-6 (pyridoxine), B-7 (biotin), B-9 (folic acid), B-12 (cobalamin). These vitamins are essential and help the body function.

A clinical study conducted in Singapore [50] showed that Covid-19 patients who were given vitamin B_{12} supplements (500 μg), vitamin D (1000 IU) and magnesium had reduced Covid-19 symptom severity and supplements significantly reduced the need for oxygen and intensive care support. According to research findings [51], riboflavin-UV decreased the infectious titer of SARS-CoV-2 below the limit of detection in human blood. Thiamine improves immune system function and has been shown to

reduce the risk of type-2 diabetes, cardiovascular disease, aging-related disorders, kidney disease, cancer, mental disorder, and neurodegenerative disorders ([52]. The benefits and functions are many. It helps in foetal brain development and reduces birth defect risks and reduces the risk of developing preeclampsia.

Sources of vitamin b are balanced diets that contain liver, kidney, meat, fish, vegetables, whole grains, fruits, soy products, eggs, cheese, milk, nuts, and seeds. Absorption of vitamin B can be reduced or prevented by certain health conditions such as heavy consumption of alcohol, kidney disease, rheumatoid arthritis, HIV (Human Immunodeficiency Virus) and inflammatory bowel diseases [53]. Vitamin B_{12} acts as a modulator of gut microbiota and low levels of B_{12} elevate methylmalonic acid and homocysteine, resulting in increased inflammation, reactive oxygen species and oxidative stress [54].

Vitamin C (ascorbic acid or ascorbate) is water-soluble and necessary for growth, development, and repair of all body tissues. Preliminary observational studies indicate low vitamin C status in critically ill patients with Covid-19 [55]. It plays an important role in certain metabolic functions such as in activation of the B vitamin, folic acid, the conversion of cholesterol to bile acids and the conversion of the amino acid and tryptophan to the neurotransmitter, serotonin [56]. It is preventive and therapeutic for scurvy, a condition associated with bleeding gum. There is considerable evidence that vitamin C protects against respiratory tract infections and reduces risk for cardiovascular disease and some cancers.

Current trials are examining the efficacy of intravenous vitamin C as cancer therapy [57]. The evidence to date indicates that oral vitamin C (2-8 g/day) may reduce the incidence and duration of respiratory infections and intravenous vitamin C (6-24 g/day) has been shown to reduce mortality [58]. Vitamin C proved its efficacy in SARS-CoV-2 treatment [59] due to its antioxidant ability, its antiviral and anti-inflammatory features, and capacity to trigger the immune response.

Vitamin D3 (Cholecalciferol) is a dietary mineral supplement. Lower serum 25(OH)D levels were associated with increased risk of laboratory-confirmed viral respiratory tract infection in children from Canadian Hutterite communities [60]. However, one study revealed that among healthy children aged 1 to 5 years [60] daily administration of 2000 IU compared with 400 IU of vitamin D supplementation did not reduce overall wintertime upper respiratory tract infections.

There has not been any research study available today that showed definite therapeutic efficacy of Vitamin D in treating Covid-19. Shorter time till viral clearance and time from cytokine release storm to recovery among patients with sufficient 25(OH)D levels was observed in a study [61] but the findings were statistically insignificant. The study demonstrated a significant correlation between vitamin D deficiency and poor Covid-19 outcomes.

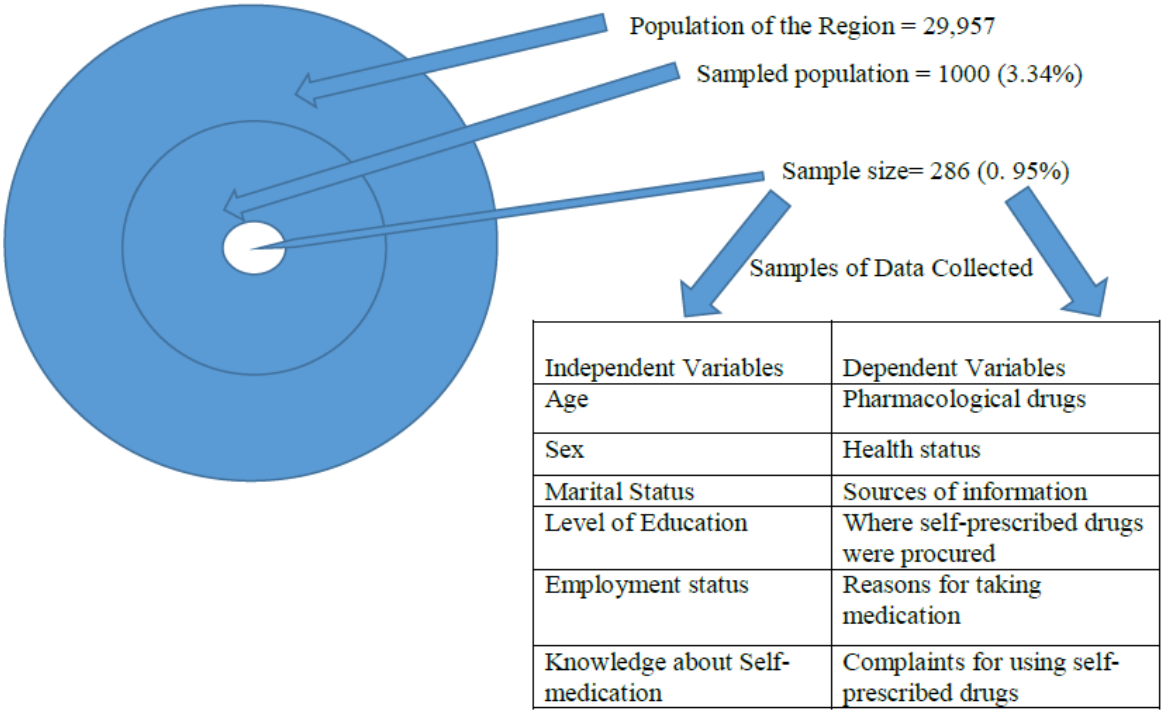
Vitamin D3 is produced when the skin is exposed to UVB radiation (from sunlight). In a Randomized Clinical Trial of Vitamin D Versus Placebo among hospitalized patients with Covid-19 [62], a single high dose of vitamin D3, compared with placebo, did not significantly reduce hospital length of stay.

Research Broad Objective was to assess the prevalence of self-medication and other health habits practiced by people of Regional Corporations in South Trinidad during the current Covid-19 pandemic. The specific objectives were to identify the demographics of people engaged in self-medication, explore the advantages and disadvantages of self-medication, highlight the benefits (if any) and harmful effects of self-medication, determine the knowledge and attitude of people who self-medicate during pandemic, find out the factors associated with self-medication and other

fortification habits and identify the medications and fortification measures taken by people.

Methodology

Study Design was a Cross-Sectional Survey.



Independent Variables	Dependent Variables
Age	Pharmacological drugs
Sex	Health status
Marital Status	Sources of information
Level of Education	Where self-prescribed drugs were procured
Employment status	Reasons for taking medication
Knowledge about Self-medication	Complaints for using self-prescribed drugs

Figure 1. Region Population, Site location, Sample Size

Study Location

The study was conducted in the PTRC (appendix 2), one of the fourteen Municipalities in the country that provides essential services to its burgesses. The population is 102,957 of which 52,382 were males and 49,992 were females according to the 2011 census. The population density is 165 persons per km2. Site selection was based on the reality of the daily increase in the number of Covid-19 cases. Distribution and collection of questionnaires were done in safe zones where sanitization, social distancing and wearing of facemasks were complied with.

The PTRC is made up of fifty-six communities of predominantly Indotrinidadians (East Indians - 55 %,) Afrotrinidadians (Africans - 24 %), Mixed (Indian/African -16%). The rest are Caucasians, Syrians, Lebanese, Chinese and others. PTRC is one of the largest municipalities by area in Trinidad and Tobago.

There are one hundred and fourty (140) office employees who work in various departments located in the main building and just over seven hundred (700) at different locations. The main building houses General Administration, Personnel Industrial Relation, Public Health, Accounts, Health and Safety, and Technical Departments. Other Departments located outside the main building are the Disaster Management Unit, Municipal Police and Transport Departments. All departments are supported by the Secretariat, Registry, Information Technology & Communication and Tenders sections.

Study Population

Employees of PTRC and members of the public who visited the Corporation for various business transactions on appointment basis because of Covid-19 pandemic restriction. Paper and Pencil Questionnaires were distributed to the indoor staff in the main building and members of public who came to the Corporation to transact business. Online questionnaires were sent via Whatsapp to field workers and those in the

departments not located within the main building. Questionnaires were placed on a desk at the main entrance near the security guard booth. A research assistant was stationed there to draw the attention of people to the questionnaire and explain its purpose. Participation was voluntary. It was a self-selection cross-sectional survey. Only those interested in participation picked up the questionnaire, supplied answers and returned it in both the online and paper and pencil formats. Pen provided to each participant was given to them to keep as part of Covid-19 transmission prevention.

Determination of Sample Size

This was calculated using Slovan's formula. N = N/1+Ne2 where n = sample size, N = population size and e = margin of error. Confidence Level was set at 95% and the level of significance was *p*-value <0.05. Sample size was 286.

The total number of employees (office/indoor and field) is eight hundred, twenty-three (823) in the ratio of 6 to 4 in favour of females. Most males were field workers. The target population is the indoor employees and members of the public who went to the Corporation daily for different transactions for the duration of the survey. Indoor employees were one hundred and fourty (140) in number. Based on transaction records, the average number of members of the public who visited the Corporation monthly was six hundred. One hundred and fourty people added to seven hundred was eight hundred and fourty (840).

Inclusion Criteria

Males and females who were above 18 years of age and volunteered to participate.

Exclusion Criteria

Males and females who were less than 18 years and unwilling to participate.

Variables

The dependent variables were allopathic medications, non-allopathic, employment status, knowledge of self-medication, Covid-19 test result, medicinal products and other measures of prevention and treatment of Covid-19 infection that were self-prescribed and administered. Demographic characteristics sex, age, level of education, marital status, employment status were the independent variables. Modifiable variables included access to products used in self-medication and personal knowledge of respondents.

Sampling Procedure/Technique

The period of survey late was twelve weeks. (mid-January 2022 to early April 2022) during the 3rd wave of Covid-19 pandemic in the country. This slowed down data collection because of public health protocol the respondents had to observe. Visit to the Corporation by the members of public was by appointment. Self-selection method was used whereby respondents chose whether or nor not to take part in the Hybrid survey of online and paper and pencil formats. In the former, a link was sent to individuals with known contact numbers. The link took them to clickable Google website to answer the survey questions. In the latter, research assistants drew the attention of employees and members of the public to the desk where the questionnaires were placed. Willing individuals picked questionnaires, supplied answers, and put them in a collection box put in place.

Survey Instrument

Interview questionnaire was used to obtain information on demography, use of self-medication and other health habits practised by the participants. Pretesting of the instrument was done to test the reliability and validity of interview guide tools of open and closed ended questions structured in three parts of A, B and C. Part A was the background information and it consisted of seven (7) questions. Part B was self-medication with antibiotics and consisted of nineteen (19) questions. Part C was on various health habits practised by the participants to

prevent and treat Covid-19 infection and it consisted of eight (8) questions.

Data Collection

Google Developers (a software development application) owned by Google was used. It was launched in 2005. It offers a variety of application programming interfaces. Data collection and analysis were facilitated through the use of two productivity tools offered by Google Developers with Google Forms and Google Charts.

A consent form was attached to the three-page interview with clear instructions on how to answer the questions after signing consent for participation. The purpose of the survey was explained to the participants and the contact of the Principal Investigator was provided in the introduction.

Demographic information such as age, sex occupation, education level, marital status and religious belief of participants were collected. Health habits data such as health status, knowledge and use of self-medication, names of medications, reasons for engaging in self-medication habit and sources of information on medications of choice were gathered. With the help of Research Assistants, questionnaire containing open-ended and close-ended questions were distributed to voluntary participants. Information on independent variables (health habits, knowledge of self-medication), dependent variables (prescription, non-prescription drugs, herbal products, and home remedies) and modifiable variables (source and ease of procuring identified dependent variables) were collected and entered as data. The data collection went on for a period of twelve weeks largely because of the limited number of participants due to Covid-19 pandemic.

The online questionnaire was created using Google Forms which is a survey administration software and collaboration tool. It allows the user to create online forms and surveys and share them via a link.

The advantage of using Google Forms over a physical survey is that it allows the user to make certain responses mandatory and the participant will not be able to submit the survey until he/she has answered all the required questions.

Data Analysis

The responses from both the online and physical questionnaires were merged using Google Charts. Google Charts is an interactive web service that creates graphical representation from data provided by the user. Data to be charted were listed, selected options to customize each chart, and the chart was created using embedded JavaScript, which is a programming language. The charts were then compiled and copied onto the research paper.

The software further analyzed the participants' responses in real-time by offering a "summary of responses "feature that created visual representation of open and close-ended questions (e.g., multiple choice, checkbox). The form creator adjusted the settings to ensure that the participants were unable to make changes to the questionnaire. Descriptive statistics such as frequency and percentage were used to present the combined data in histograms, graphs, tables, bar charts and line graphs as applicable.

Calculation using Confidence Interval, Z-score, Chi square was performed with the use of online calculator (cited below each table presented) on various variables of respondents to derive statistical significance of p-value <0.05. Descriptive statistics (percentage, frequency etc.) was used for data presentation in bar charts, pie charts, tables, line graphs, bar graphs and histograms. Total samples and percentages of responses to questionnaires was calculated for each item chosen by respondents. Multivariate Logistic Regression analysis was performed on the independent and dependent variables.

Ethical Considerations

Permission was sought and granted by the Research Ethics Committee in the jurisdiction where the survey was conducted. Consent forms

were given to participants to sign to document their willingness to participate in the study. Participants' names and places of residence were not required to be supplied in the questionnaires. Data gathered was not and will not be shared inappropriately.

Quality Control of Collected Data

The questions were written English Language with no slang and abbreviation. The filled questionnaire was placed in a locked collection box with a padlock to which only the Principal Investigator and two research assistants had access.

Results and Discussion

Demographic Characteristics information of the participants was collected. The research aim was to find out the prevalence of self-medication and other health habits practiced by the targeted population of a Regional Corporation in South Trinidad in the current Covid-19 pandemic. The prevalence was 66.8% (n = 286). It falls within the range of 53.3 % [63] to 80.4% [64]. In studies done in different parts of the world prevalence of self-medication with antibiotics, self-medication, prevalence of self-medication with antibiotics was 48% in Kenya, 50.3% in Northern Nigeria, India (62.67%), Uganda (65.1%), Sierra Leone (68.9%), Ghana (70%) and Sudan (76%),

The survey questionnaire was in online and paper and pencil formats. The two formats had the same type and number of questions. The online format was programmed such that submission button could only be activated when all questions were answered. The sampled population was one thousand (1000) and the sample size was two hundred and eight six (286). The population of interest was of size N = 1000. Estimate of p, the proportion of the population that practiced the specific habits was done. An unbiased point estimator of p is $\hat{p}$, the sample proportion. In a sample of size n = 286, 191 persons were found to practice specific habits. We therefore have $\hat{p}$= 191 divide by 286 as the unbiased estimator of p. In a population of N = 1000, we therefore expected 191 divided by 286 × 1000 = 668 persons to practice self-medication for prevention and treatment of Covid-19 infection. There were ninety-one (91) respondents for the online formats and one hundred and ninety-five (195) for the paper and pencil format. The number of respondents was not the same for all the questions in the paper and pencil format and number.

Age of most respondents were in the 26-35 (average age of 31 years) and 36-45 age groups

(35 years average), 28.8% apiece. In a study [65] carried out in Ethiopia, 29.8% of respondents were in the age range of 27 to 35 years of age. In this survey, 36 to 45 being the most represented while 18 to 25 age groups (9.1%) were the least in what was captured. This reflects the Corporation work force and members of the public that go there to conduct business such as payment for issuance of food badge, cesspit cleaning, bulk waste removal etc. Others go there to lodge complaints on various issues that affect them in the communities such as clogged drains, overgrown bushes, rat infestation, menacing stray dogs and so on.

Table 1. Age Range of the Participants

	18 -25	26-35	36-45	46-55	Above 56
Frequency	31	77	78	56	43
Percentage	9.1%	28.8%	28.8%	19%	14.2%

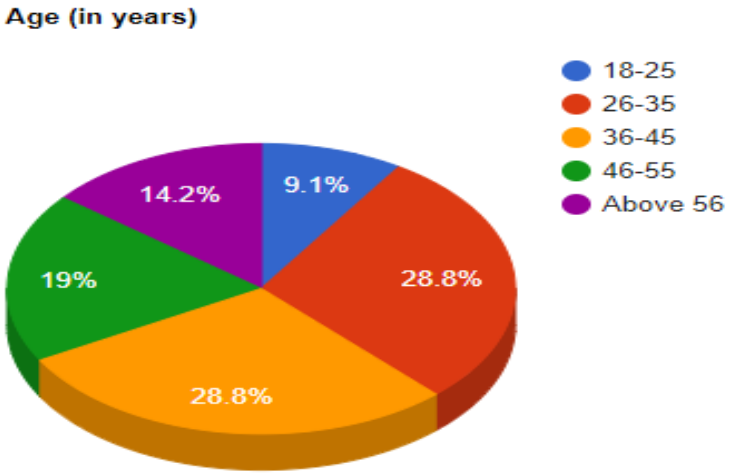


Figure 2. Age range of the participants

Females outnumbered males. Office staff members are overwhelmingly females. Field employees are males in the majority. No significant gender disparity among the non-staff respondents. A study in Egypt [66] showed that the overall prevalence of self-medication among the students who participated was 40.8% for males and 59.2% for women. In the PTRC, over 60% of the work force were females and is so reflected in the results of the current research study. Generally, there are reasons why women are more health-conscious than males based on the observation of the researcher.

Table 2. Sex of the Participants

Sex	**Male**	**Female**
Frequency	127	158
Percentage	44.4%	55.6%

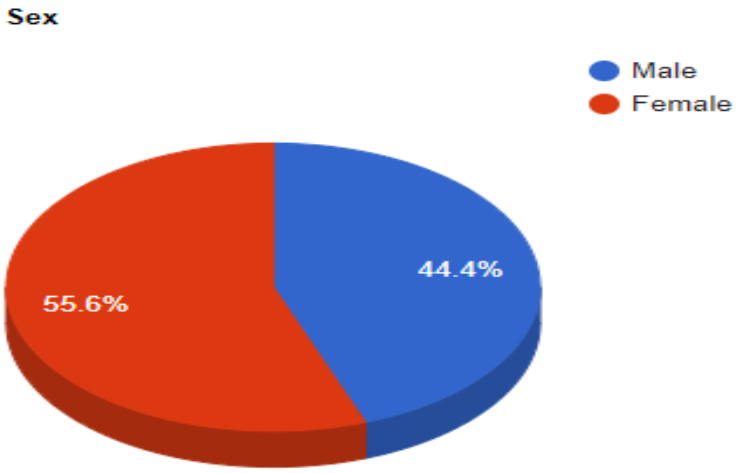


Figure 3. Pie Chart Illustrating Sex of Respondents

Most participants were married. Thirty-three respondents did not indicate their marital status as done by two hundred and eight four people. 49.3% (n = 140) were married, 37.7% (n = 107) single, 8.8% (n = 25) divorced and 4.2% (n = 12) separated. In some study papers reviewed,

married respondents were also in the majority, but the percentage was higher than recorded in current sturdy. Depending on the location, married respondents could be in the ratio 9 to one to single respondents and vice versa.

In a Self-Medication Practice cross-sectional survey among University of Gondar College of Medicine and Health Sciences Students in Ethiopia [67] 78.5% (n = 780) were single, 1.5% (n = 12) were single, expectedly.

Table 3. Marital Status

Marital Status	Single	Married	Separated	Divorced
Number	107	140	12	25
Percentage	37.7%	49.3%	4.2%	8.8%

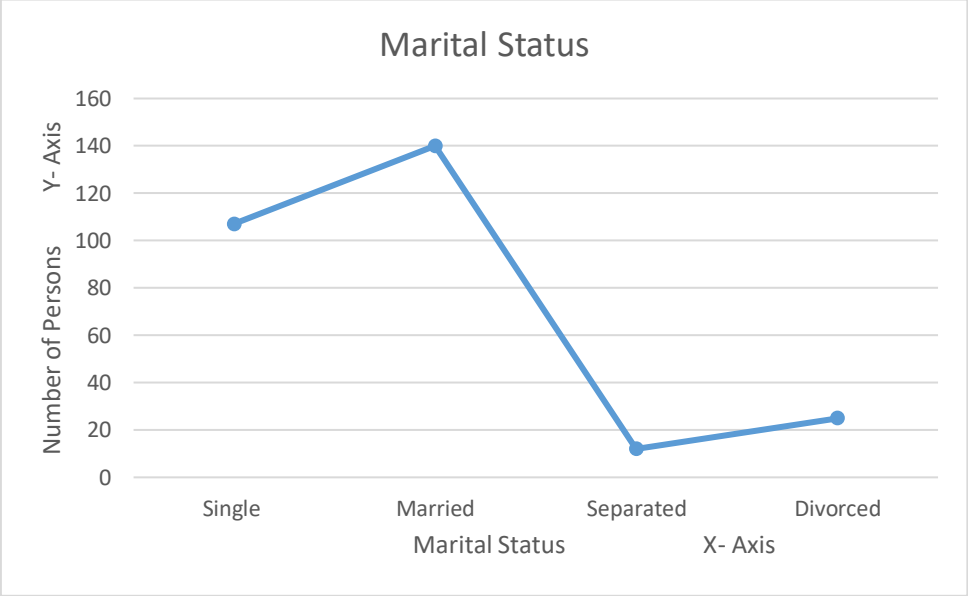


Figure 4. Marital Status

Level of Education

Most of the participants are well-educated. Very few respondents did not indicate their level of education. This is higher than the regional average of Primary, Secondary and Tertiary/University levels of education attaie.

Table 4. Level of Education

Level of Education	Primary	Secondary	Tertiary	Others
Respondents	32 (11.2%)	91 (31.8%)	157 (54.95)	2

Antimicrobials

Ivermectin was the most used (9.4%), Azithromycin (3.1%), Doxycycline (2.1%) and chloroquine (1.06%). Steroid (3.5%) is not antimicrobial but is used more than antimicrobials except ivermectin (Table 5).

Vitamins and Minerals: Vitamin C was the most commonly self-prescribed (63. 3%). The least used was Omega (1.05%) (Table 6).

Analgesics

Panadol ranked first at 33.6% followed by Advil (10.5%0 and Panadeine (10.1%). Only 0.7% used Ibuprofen and Aspirin (Table 7).

Table 5. Antimicrobials self-prescribed

Antimicrobials self-prescribed and administered to prevent or self- treat Covid-19	**Number of Respondents (n = 286)**	**Percentage**
A. Chloroquine	3	1.055%
B. Ivermectin	27	9.4%
C. Doxycycline	6	2.1%
D Zithromax	9	3.1%
E. *Steroids (Prednisolone)	10	3.5%

*Steroids are not antimicrobials

Table 6. Vitamins and Minerals Used

Vitamins self-prescribed and administered	**Respondents (n = 286)**	**Percentage**
C	181	63.3%
B Complex	34	11. 9%
D3	128	44.8%
Zinc	174	60.8%
Multivitamins	27	9.4%
Omega	3	1.05%
Vitamin E	7	2.4%

Table 7. Analgesics self-prescribed

Analgesics self-prescribed and administered to prevent or treat Covid-19	**Respondents (n – 286)**	**Percentage**
Ibuprofen	2	0.7%
Advil	30	10.5%
Panadol	96	33.6%
Panadeine	29	10.1%
Tylenol	9	3. 1%
Paracetamol	47	16.4%
Excedrin	20	7.0%
Aspirin	2	0.7%
Norgesic	6	2.1%
Olfen	11	3.8%
Buscopan	5	1.7%
Voltaren	13	4.5%
Flamax	8	2.8%
Mydocalm	12	4.2%
Motrin	8	2.8%
Cataflam	8	2.8%

Sources of information

Majority of the respondents (75.5%) bought self-medication drugs from community pharmacy outlets. Online shopping was 3.8%. Leftover from previous prescription was 14.7%. (Table 8).

Table 8. Sources of Information

Sources where self-prescribed medication procured	Respondents (n = 286)	Percentage
Community Pharmacies	216	75.5%
Left over from previous prescription	42	14.7%
Online shopping	11	3.8%
Others	7	2.4%

Determinants of Self-medication Choices

Self-experience (44.4%), recommendation by community pharmacists (39%) and Doctor's prescription were strong determinants of self-medication choices (Table 9).

Table 9. Determinants of Self-medication Choices

Choice of Self-Prescribed Medication Determinants	Respondents (n = 286)	Percentage
Recommendation by community pharmacists	112	39.2%
Opinion of family members	62	21.7%
Opinion of friends	23	8.04%
My own experience	127	44.4%
Based on previous experience	66	23.1%
Doctor's prescription	97	33.9%
Advertisement	11	3.8%
Others	7: alternative medicine (1), Internet (2), Herbalist (1), My expertise (1), Google search (2)	2.4%

Table 10. Common Adverse Reactions

Common adverse reaction(s) experienced by participants	Respondents (n = 286)	Percentage
A. Nausea	67	23.4%
B. Vomiting	24	8.4%
C. Diarrhea	33	11.5%
D. Rash	21	7.3%
E. Vaginal thrush	9	3.1%
F. Drug resistance	12	4.2%
G. None	119	41.6%

Table 11. Complaints for which self-prescribed medications were used

Complaint(s) for which self-prescribed medications were used	**Sore throat**	**Fever**	**Body aches and pains**	**Vomiting**	**Diarrhoea**	**Headache**	**Others**
Frequency (n = 286)	100	94	129	51	59	120	20
Percentage	35%	32.9%	45.1%	17.8%	20.6%	42%	7.0%

Discussion

Prevalence of antimicrobial use in preventing and treating covid-19 infection in this current study is 19.2% n= 55). The government issued warning and caution on radio and television against the use of antimicrobials specifically for Covid-19 unless prescribed by licensed physicians. The prevalence of self-medication with antibiotics for the prevention and treatment of Covid-19 was 30.3% (95% CI: 26.7–34.1). In Poland [68], 16.6% was the prevalence of those who took antibiotic medication as a precaution and 16.8% engaged in antibiotic formulation without consultation (Table 12).

Table 12. Prevalence of Antimicrobials, Vitamins, and Analgesics

Medication and Home Remedies to Treat and Prevent Covid-19 Infection	**Antimicrobial (Antibiotics, anti-parasitic and steroids)** Zithromax, Septra, Augmentin Chloroquine Ivermectin, doxycycline	**Vitamins and Minerals** C, B12, D3, Zinc	**Painkillers** NSAIDS (Ibuprofen, cataflam, olfen), Panadol, Paracetamol Panadeine, Tylenol
Frequency= 286	55	286	286
Percentage	19.2%	100%	100%

All the respondents in this study used Panadol and Paracetamol (100%, n = 286) for pain. Female gender (odds ratio [OR]) = 1.603, working in the medical field (OR = 1.697), and history of Covid-19 infection (OR = 2.026) were variables associated with self-medication. Olfen, Diclofenac, Advil (Ibuprofen) were the NSAIDs commonly used by most respondents.

Multivariate Regression Analyses of Individual Independent Variables (demographic characteristics) Vs One Dependent Variable (Self-medication) are depicted in Table 13. Age group 26 -35: COR 0.15, 95% CI 0.04, 0.51, P-value 0.00129 is significantly associated with use of self-prescribed pharmacological drugs. Females have 0.96 COR over males on self-medication (95% CI (0.59, 1.59). Marital status: respondents separated from their spouses have COR 2.48 over single, married, and divorced respondents (95% CI (1.02, 6.06) (Table 13).

Table 13. Multivariate Regression Analyses of Individual Independent

Variables Dependent → Independent ↓	**Self -Medication**		**OR**	**CI 95%**	***P*-value**	**Z - score**
	Yes	**No**				
Age						
18 – 25	24	11	1	(0.04, 0.51)	0.00129	3. 0235
26 - 35	59	4	0.15	(0.38, 2.09)	0.392	0.2725
36 – 45	59	24	0.89	(0.43, 2.61)	0.447	0.1329
46 – 55	39	19	1.06	(0.36, 2.39	0.4365	0.1596

Above 56	33	14	0.93	(0.04, 0.51)	0.00129	3. 0235
Sex						
Male	85	42	1	-	-	-
Female	107	51	0.96	(0.59, 1.59)	0.4436	0.1418
Marital Status						
Single	78	29	1	-	-	-
Married	101	39	1.04	(0.59, 1.83)	0.4476	0.1315
Divorced	9	3	0.89	(0.23, 3.54	0.4381	0.1557
Separated	13	12	2.48	(1.02, 6.06)	0.0229	1.9960
Level of Education						
Primary	21	11	1	-	-	-
Secondary	63	28	0.85	0.36, 1.99)	0.3531	
Tertiary	123	34	0.53	(0.23, 1.2)	0.0638	0.3768
Others	1	2	3.82	(0. 31, 46.9)	0.1476	1.5233
Employment Status						
Employed	144	75	1	-	-	-
Not Employed	44	23	1.0172	(0.5712, 1.8113	0.9538	0.058
Knowledge about Self-prescribed Medication						
Yes	137	72	-	-	-	-
No	51	26	0.9700	(0.5587, 1.6843)	0.9140	0.108

Respondents between 36 to 55 years of age practiced self-medication than the rest of the age groups. This contrasts to a study done in Tariz, Iran [69] before Covid-19 pandemic that showed chance of self-medication was higher in young (P=0.007) and middle-aged (P=0.012) groups, and housewives (P=0.048). There was no significant relationship between gender and self-medication (P=0.553). Prevalence was 38.9% (95% CI 1.56, 1.64) in Southwest Ethiopia [70], 75.1% (n = 195) of the respondents were employed. It was found in a study [10] that government employment (AOR 0.31, 95% CI 0.12–0.82) positively correlated with self-medication. This contrast sharply to the study among Vietnamese resident in highland province in which females (OR=0.59, p<0.05), white-collar worker (OR=0.25, p<0.01) and had higher number of children in the family (OR=0.68, p<0.05) were less likely to practice self-medication. 73.1% of respondents had knowledge about SMDHH. A study in Nigeria (Bello *et al*., 2022) [71] revealed that knowledge of COVID-19 symptoms did not significantly predict self-medication. The crude odds ratio of employment and practice of self-medication is 1. 0172 time the odds of not being employed and practice of self-medication. (95% CI 0.57 to 1.81, p-value 0.9538). The crude odds ratio of having knowledge about self-medication and practicing it is 0.9700 times that of not having the knowledge and practicing self-medication. It is not statistically significant at p 0.140.

Conclusion

This research study assessed prevalence of self-medication to prevent and treat Covi-a9 infection. Overall prevalence with self-medication with antimicrobials, analgesics, vitamins, minerals, herbal products, and home-based remedies was 66.8%. Prevalence of all antimicrobials combined was 19.2%, all vitamins combined was 100%, all analgesics combined was 100%, essential oils was 61.9%, steam inhalation was 51% and all herbal products and home-based remedies combined was 100%. Ivermectin (n = 27) followed by Azithromax (n = 9) was the most used antibiotic, Panadol (n = 96) followed by paracetamol

(n=47) was the most used analgesic. vitamin C (n = 181) followed by Zinc (n = 174) and vitamin D3 (n = 128) was the most used of all vitamins.

Recommendations

Large studies are recommended to be carried out nationally, regionally, and internationally and the results shared with relevant government and non-governmental agencies. This will necessitate formulation of health policies to better inform the population on the trend and guide people on self-medication and educate them on the risks posed by it. Pharmacists need to be guided by regulation to reduce access of the population to drugs in general. Community health education and government intervention are needed as urgent priorities.

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Conflict of Interest

The author confidently declares that there was no conflict of interest before, during and after the research study was carried out. The cost of the study was borne entirely by the Principal Investigator.

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