The Prevalence of Auto-Medication among Pregnant Women in a Conflict Affected, North West Region, Cameroon

Tanyi Pride Bobga[1,2]*, Sangwe Bertrand Ngwa[3], Ngwa Fabrice Ambe[1,2,4], Ateh Stanislas Ketum[5], Agbornkwai Nyenty Agbor[5], Wirnkar Jude Kanla[2,6], Mentoh Ajem Abungwi[7]

[1]Model Preparatory Initiative of Academics, Research and Health, MOPIARH, Buea, Cameroon
[2]Modern United Faculties of Medicine Entrance Preparatory Center (MUFEPREC), Buea, Cameroon
[3]Centre Pasteur, Yaoundé, Cameroon
[4]Department of Medical Laboratory Sciences, INSAM Higher institute of Medical Sciences, Douala, Cameroon
[5]Family Health International, Yaoundé, Cameroon
[6]Department of Medical Laboratory Sciences, Faculty of Health Sciences, University of Buea, Buea, Cameroon
[7]Department of Pharmacy, Faculty of Medicine and Pharmaceutical Sciences, Douala, Cameroon
Email: *bobgaatanyi@yahoo.com, ngwafabrice12@gmail.com, atehstanilask@gmail.com, ajemsamira@gmail.com,
bertrandsangwe@yahoo.com, wirnkarjude1@gmail.com, a_nyenti@yahoo.com

Abstract

Background: The excessive use of medicines and generally self-medication is considered as one of the major health and socio-economic problems in different countries. There is increasing evidence that self-medications among pregnant women are common in many developing countries. Despite the adverse impact on pregnancy, there are few programs available for their control. The Northwest region of Cameroon has been affected by socio-political crisis since 2016, which has slowed down economic activities and have grievous effects on the economy. It was therefore necessary to evaluate the prevalence of auto-medication amongst pregnant women. **Aim:** The aim of this study is to ascertain the knowledge, prevalence and practice of auto medication among pregnant women in Cameroon especially in the North West Region. **Method:** A community based cross-sectional study was conducted among 500 pregnant women, aged between 15 - 45 years in the Bamenda Health District between January to October 2019. A structured questionnaire based interview was used to collect data from each study subject. Then, data were categorized and analyzed using SPSS version 20 software. **Results:** The prevalence of auto-medication (allopathic and herbal medicines) in this study was 337 (67.4%) and was predominant during the first trimester 246 (72.86%) of pregnancy. 98 (29.09%) previous experience, 70 (20.77%) that they did not have money for consultation, 70 (20.77%) non-severity of ailments and 75 (22.25%) high cost of

medication in hospital/pharmacy were the most common reason pregnant women auto medicate. 96 (28.48%) antiemetic, 72 (21.36%) analgesics and 58 (17.21%) antacids were the most frequent drugs used for auto-medication and the main symptoms for which pregnant women practice auto-medication were: 72 (21.36%) fever/headache, 63 (18.69%) constipation and 58 (17.21%) nausea/vomiting. 116 (34.42%) friends/family/neighbors were the main source of recommendation in auto medication. 96 (28.49%) of the self-medicating pregnant women, self-medicate with local herbs and 40 (41.66%) blood leaves (iron supplement) was the most used plant (herbs) in our study. **Conclusion:** We conclude that after 3 years of crisis in this region, the prevalence of auto-medication is increasing at a geometric rate and becoming a practical routine. Adequate counselling of reproductive age girls by healthcare professionals about the potential risks of self-medication with herbal medicine and allopathic drugs during pregnancy is strongly recommended.

Keywords

Pregnant Women, Bamenda Health District, Auto Medication, Allopathic Medicine, Herbal Medicine

1. Introduction

Nowadays, the excessive use of medicines and generally self-medication is considered as one of the major health and socio-economic problems in different countries [1]. Auto-medication is defined as the acquisition and use of one or more medicines without a physician's opinion or diagnosis as well as without prescription or therapeutic monitoring, including the use of herbal or allopathic medicines [2]. Auto medication is a global phenomenon that occurs in "people of all socio-demographic categories" [3]. In most developing countries such as Cameroon where there is ready accessibility to drugs, the likelihood that people will auto medicate is high, with the inclusion of pregnant women [4] [5]. The most common ailments for which the pregnant women practiced self-medication were the common cold, headache, anemia and nausea/vomiting [6]. There is a general fear among women in the use of allopathic or herbal medications during pregnancy. Some of the reasons for the increased rate of self-medication are the followings: the urge to self-care, feeling sympathy for the family members during illness, lack of health care services, poverty, ignorance, misconceptions, extensive advertisements on drugs and the availability of drugs in places other than pharmacies, high cost of consultation of private doctors, emergency use and prior experience about illness, ready access to drugs, greater availability of medicinal products [7]. Given the current global economic downturn and due to the difficulties to meet the health care needs of the people especially in sub-Saharan Africa, many countries are facing serious health challenges [8]. Such a condition in developing countries often motivates most of the people to practice self-medication using different types of materials and medical plants to meet their medical needs

[9]. Nevertheless, many medicinal plants lack scientific evidence for their toxicity, chemical composition, and pharmacological effects. Despite improving access to healthcare in urban areas, many people rely on medicinal plants [6]. The World Health Organization pointed out that, auto medication could be good if properly done, because it helps to prevent and treat ailments that do not require medical consultation, provides the active role of the patient in his or her own health care [10]. Regardless of the unquestionable benefits obtained from auto medication, the negative effects of self-medication are diverse and may include effects such as treatment failures, drug toxicity, and increase in treatment cost, prolonged hospitalization periods and increase in morbidity. What makes self-medication more dangerous in developing countries is that the basic knowledge concerning the pharmacological properties of these drugs and how they may affect those who practice it are not well known [4] [5] [6]. The adverse effects of self-medication become more serious when the self-medicating person is a pregnant woman [4] [5] [6]. Self-medication by pregnant women especially in the first trimester of pregnancy can cause some serious effects to the unborn baby and the mother. These effects may include malformation of children, or hindrance in normal growth of the baby, defects in the development of the reproductive organs, urinary retention, intersex, undescended testis and other problems with the urethral [4]-[9].

In developing countries, and particularly in Africa, studies have revealed a higher burden (30% - 85%) of self-medication [11]. Studies reported in Ethiopia revealed a prevalence of auto medication among pregnant women of 50.4% [12] and 69.4% [13], in Nigeria 85% self-medication was reported among pregnant women [14], 59.9% of pregnant women auto medicated in Democratic Republic of Congo [15] and prevalence of auto-medication with antimicrobials in Cameroon was 68.4% [16]. These figures suggest that prevalence of auto medication is high in many regions of the globe. The practice of auto-medication among pregnant women continues to be alarming, despite the associated risks. However, there is little documentary evidence on what has been done to ascertain the knowledge, prevalence and practice of auto medication among pregnant women in Cameroon especially in the North West Region.

2. Materials and Methods

2.1. Study Area and Setting

This study was carried out in the Bamenda Health District. Bamenda is the Capital City of the North West region, with an estimated population of about 2 million people and is located 366 km North West of Cameroon capital (Yaoundé). It is a town that offers educational, administrative purposes and farming to a large number of people from all the regions. A community based cross-sectional descriptive study was conducted among pregnant women in the Bamenda Health District (BHD). Briefly, the BHD is one of the 19 health districts in the North West region. It is located at the heart of the North West Regional Head

Quarter (Bamenda) and has a population of over 500,000 inhabitants. It has 17 Health Areas-14 public and 3 confessionals. Bamenda has two major seasons-the dry season which is very dry and dusty and the cold rainy seasons.

2.2. Study Design

It was a community-based study. This study used a cross-sectional design to sample all pregnant women in the Bamenda Health District (BHD). The study period was between January 2019 to October 2019. The respondents (pregnant women) were given questionnaires designed in English, to assess the patterns of auto medication amongst pregnant women in a given place and time. Data were collected using standardized data collection instruments that were field-pretested to ensure reliability and validity.

2.3. Study Population

2.3.1. Inclusion Criteria
Pregnant women of all age group, resident in the Bamenda Health District who signed the Informed Consent form were included in the study.

2.3.2. Exclusion Criteria
All pregnant who were unable to communicate or hear and mentally disable were excluded from the study. Pregnant women who were absent during data collection and who did not sign the Informed Consent form were excluded from the study.

2.4. Sampling Procedure

The sampling method was a non-probability sampling (Consecutive), reason being that the researchers did not know the number of pregnant women that were present. However, this method relied on the researcher's ability to select pregnant women and the sampling technique was not a fixed or predefined selection process which made it difficult for all the participants (pregnant women) of the population to have equal opportunities to be included in the sample.

2.5. Sample Size

A sample size of 327 participants was calculated from the formula:

$$N = \frac{Z^2 \times P(1-P)}{d^2}$$

where, N = required sample size, Z = confidence interval (95%) *i.e.* 1.96, P = pre-estimated prevalence (69.4%) obtained from a similar study carried out by Jambo *et al.*, in 2018 in Ethiopia [13] by. d = error margin (5%).

Sample size attained was 500 participants

2.6. Ethical Considerations

Administrative clearance was gotten from the North West regional delegation of

public health and the Bamenda Health district. Participants were given a consent form respectively, to fill as an initial step in the participation process after the study purpose had been well explained to them. Participants were informed of their full autonomy over their participation in the study and the freedom to withdraw at any time if they so desired.

2.7. Data Collection Tools

Questionnaires were used in collecting quantitative data. The questionnaire was divided in to 4 sections, Section A; Socio-demographic data (age, sex, level of education, occupation, marital status), Section B; Prevalence of automedication (the number of people that took drugs without prescription), Section C; Knowledge of automedication (whether they were aware of the information about the drugs that they used and where they got the information) and Section D; Practice of auto medication (weather they took drugs without prescription, the number of times, the type of drug and the source of drug). The questionnaire was both an open ended and close ended questions.

2.8. Data Management and Analysis

Questionnaires were designed using Epi info version 7 and all data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 20 for windows. Data was collected using a questionnaire and checked for errors. Data were edited, coded and entered into a computer using Microsoft Excel software. Back up storage was done in CD and all raw data were stored safely in a computer secured with a password. After the data had been entered, univariate descriptive analysis, using frequency tables, Histograms, bar graphs and pie charts were derived. The analysis was guided by the key objectives and research questions and the analysis was done in relation to the literature reviewed.

3. Results

3.1. Socio-Demographic Data

Distribution of Respondents According to Ages

500 pregnant women patient aged range from 15 - 45 years were involved in this study. Majority 149 (29.8%) of the participants falls within the age group 21 - 25 years and age (≥40) years constituted 34 (6.80%) minority of the participants. Also the ages ranging from 15 - 20, 26 - 30, 31 - 35 and 36 - 40 years gave a total of 115 (23.00%), 96 (19.20%), 58 (11.61%) and 48 (9.60%) participants respectively (Table 1). Out of 500 participants, majority 264 (52.88%) of the participant were married while minority 236 (47.12%) of the participants were single. Among the 500 respondents who participated in this study, most 48.07% (240) of the participant has attained secondary level while minority 19.23% (96) of the participant was university student or graduates.

Based on the occupation of the study participants, majority 140 (28%) of the

Table 1. The demographic characteristics of pregnant women in the Bamenda Health District (n = 500).

Variable	Frequency	Percentage (%)
Age (years)		
15 - 20	115	23.0
21 - 25	149	29.8
26 - 30	96	19.2
31 - 35	58	11.61
36 - 40	48	9.60
≥40	34	6.8
Marital Status		
Married	264	52.88
Single	236	47.12
Education		
Primary	164	32.7
Secondary	240	48.07
University	96	19.23
Occupation		
Student	87	17.4
Health personnel's	42	8.4
Teacher	36	7.2
Farmer	140	28
Trader	68	13.6
Civil servant	58	11.6
Others	69	13.8

pregnant women were farmers while minority were teachers (Table 1). Also, based on occupations; student, civil servant, health personnel's, trader gave a total of 84 (17.4%), 58 (11.6%), 42 (8.4%) and 68 (13.6%) participants respectively while others 69 (13.8%) which comprise of seamstress, hair dresser just to name a few.

3.2. Evaluate the Prevalence of Auto Medication among Pregnant Women

3.2.1. Distribution of Respondents Based on If They Are Taking/Have Taken Drugs without Prescription

A total of 500 participants were recruited for the study, 337 (67.4%) respondents accepted that they are taking/have taken drugs without prescription while minority (32.6%) 34 respondents refused taking automedication. Therefore the majority of the participants took drugs without prescriptions giving a prevalence of automedication (67.4%) among pregnant women.

3.2.2. Distribution of Respondents with Respect to the Stages of Pregnancy They Took Drugs without Prescription

Out of the 337 respondents who accepted taking/have taken auto medication, 246 (72.86%) confirmed taking drugs without prescription at 0 - 3 months of

pregnancy, followed by 16 (122.86%) at 4 - 6 months of pregnancy and 3 (4.28%) at 7 - 9 months of pregnancy (**Figure 1**).

Out of the 337 participants who accepted taking/have taken auto medication, majority 96 (28.48%) of the participants replied they recall taking antiemetic while minority 6 (8.57%) took antimalarial drugs. Also, 72 (21.36%), 58 (17.21%) and 43 (12.76%) of the 337 participants who accepted taking/have taken auto medication replied they took antacids, analgesics, and antibiotics respectively (**Figure 2**).

3.2.3. Distribution of Respondents Based on How Often They Take Drugs without Prescription

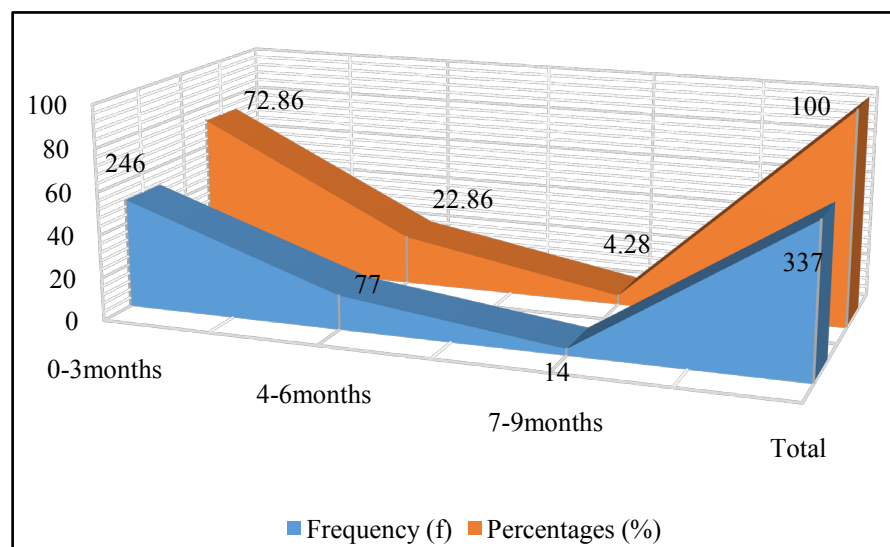Out of the 337 participants who accepted taking/have taken auto medication,

Figure 1. Distribution of respondent base on the stage of pregnancy they took auto medication.
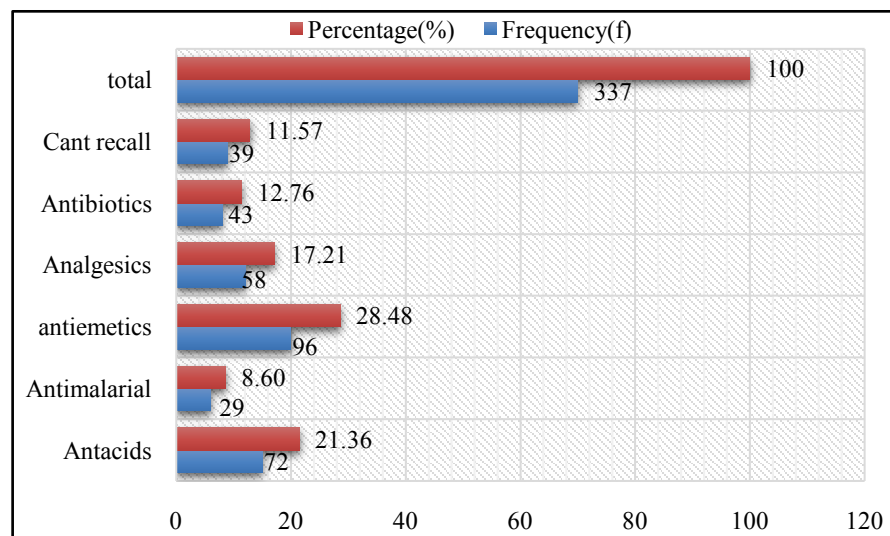

Figure 2. Distribution of respondents according to the drugs they recall taking.

majority 130 (38.57%) replied they have taken drugs without prescription twice while 38 (11.29%) replied they cannot recall. Also, 63 (18.69%) and 106 (31.45%) of the 337 participants who accepted taking/have taken auto medication replied they have taken drugs without prescription once and often respectively (**Figure 3**).

3.3. Evaluate the Knowledge of Auto Medication among Pregnant Women

3.3.1. Distribution of Respondents Based on Their Awareness on the Drugs Used

Regarding the awareness on the drugs used, Out of the 337 participants who accepted taking/have taken auto medication, most 72 (21.36%) respondents auto medicate because they had fever/headache while minority 43 (12.76%) of the respondents could not recall while the auto medicate. 58 (17.21%), 48 (14.24%), 63 (18.69%), 53 (15.73%) of the 337 participants who accepted taking/have taken auto medication, auto medicate due to nausea/vomiting, cough/cold, constipation and gastritis respectively (**Table 2**).
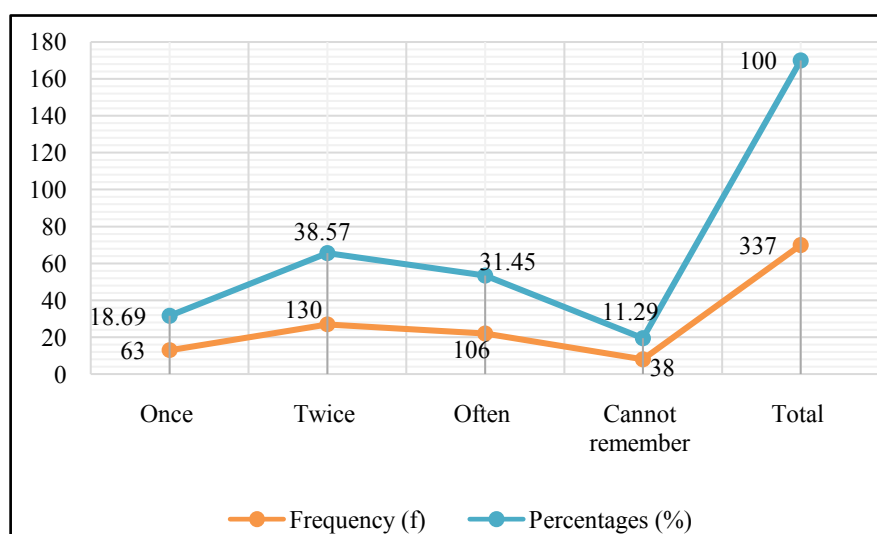

Figure 3. Distribution of respondent's base on how often they take auto medications.

Table 2. Distribution regarding the awareness on the drugs used.

Responds	Frequency (*f*)	Percentage (%)
Fever/headache	72	21.36
Cough/cold	48	14.24
Nausea/vomiting	58	17.21
Constipation	63	18.69
Gastritis	53	15.73
Cannot recall	43	12.76
Total	337	100

3.3.2. Distribution of Participants Based on the Source of Information about these Drugs

Out of the 337 participants who accepted to have taken drugs without prescription, majority 116 (34.42%) of respondents who auto medicate replied that, their source of information was from friends/family/neighbours while minority 48 (14.24%) replied was from hospital/pharmacy. 106 (31.45%) and 67 (19.88%) of the 337 participants who accepted to have taken drugs without prescription, replied that their source of information was from medicine stores and past prescription respectively (**Figure 4**).

3.3.3. Distribution of Respondents If They Are Taking/Have Taken Herbal Medication

Out of the 337 participants who accepted to have taken drugs without prescription, 96 (28.49%) accepted talking herbal medications while 241 (71.51%) refused taking herbal medications. Out of the 96 (28.49%) respondents who accepted taking herbal medication, most 40 (41.66%) respondents replied they took blood leaves (iron supplement) while minority 6 (6.25%) of respondents said that they cannot recall. Also, 20 (20.83%), 20 (20.83%) and 10 (10.41%) of the 96 (28.49%) respondents who accepted taking/have taken herbal medication said they took masepo, fever grass and guava/pawpaw leaf respectively (**Figure 5**).

3.4. Evaluate the Practice of Auto Medication among Pregnant Women

3.4.1. Distribution of Respondents Based on Their Reason for Getting Auto Medications

Out of the 337 participants who accepted taking/have taken auto medications,
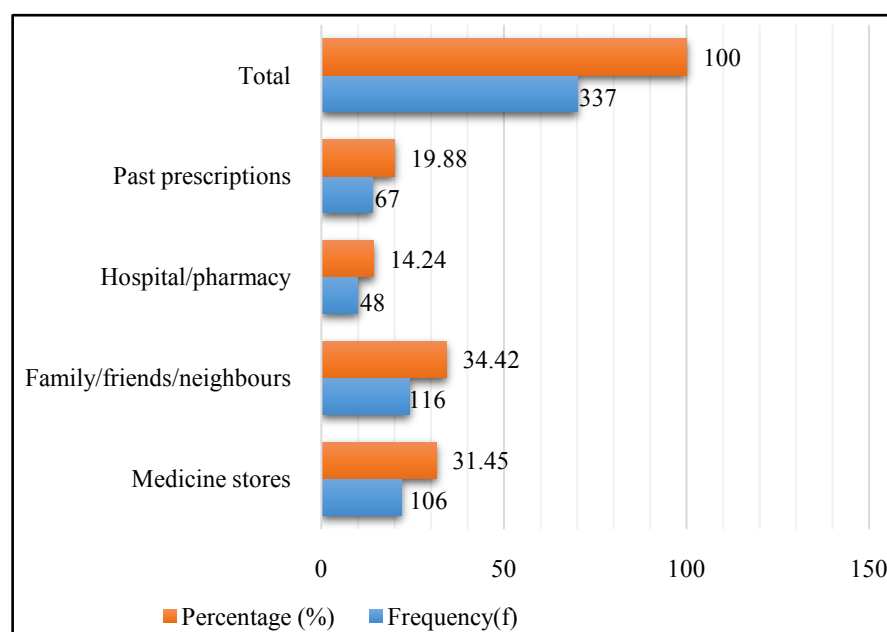

Figure 4. Distribution of respondents based on the source of information of the drugs.
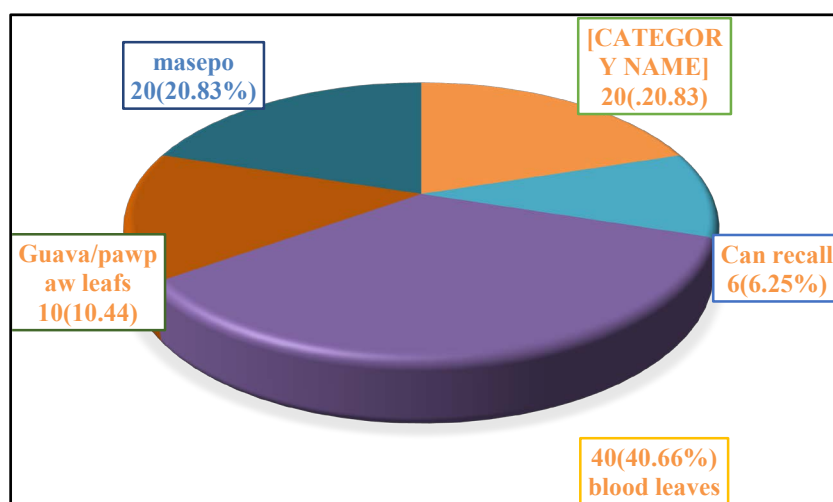
Figure 5. Distribution of respondents based on the herbal medication.

most 98 (29.09%) said the auto medicate due to previous experience while minority 24 (7.12%) auto medicate due to long distance from home to health facility. Also, 70 (20.77%) 70 (20.77%) and 75 (22.25%), of the 337 participants who accepted taking/have taken auto medications, said the auto medicate because they did not have money for consultation, non severity of ailment and High cost of medication in hospital/pharmacy respectively (Table 3).

3.4.2. Distribution of Respondents Based on the Outcome after Taking These Drugs

Out of the 337 participants who accepted taking/have taken auto medications, majority 226 (67.06%) of respondents replied they felt better after auto medication, followed by 63 (18.69%) of respondents that, replied there was no changes and 48 (14.25%) replied the situation get worse (Figure 6).

3.4.3. Distribution of Respondents Who Think Auto Medication Is Preferred over Hospital Management of Mild Ailments

Regarding respondents who think auto medication is preferred over hospital management of mild ailments, majority 217 (64.39%) disagree that auto medication is preferred over hospital management of mild ailment while minority 120 (35.61%) of respondents think that auto medication is preferred over hospital management of mild ailment. Out of the 120 (35.61%) participants who think auto medication is preferred over hospital management of mild ailment and regarding their reasons, 38 (31.67%) preferred auto medication because they easily felt relief while 24 (20%) preferred auto medication because it's not time consuming and drugs are easily accessible respectively. Also, 34 (28.33%) preferred to auto medicate because it is not expensive (Table 4).

4. Discussion

500 pregnant women, aged range from 15 - 45 years were involved in this study, majority 149 (29.8%) of the participants were within the age range of 21 - 25 yrs.

Table 3. Distribution based on respondent reason why they auto-medicated.

Responds	Frequency (*f*)	Percentage (%)
High cost of medication in hospital/pharmacy	75	22.25%
Previous experience	98	29.09
Non severity of ailment	70	20.77
Did not have money for consultation	70	20.77
Long distance from home to health facility	24	7.12
Total	337	100.00

Table 4. Respondent reasons think auto medication is preferred over hospital management of mild ailment.

Responds	Frequency (*f*)	Percentage (%)
Not time consuming	24	20
Not expensive	34	28.33
They easily felt relief	38	31.67
Easy accessibility of drugs	24	20
Total	120	100
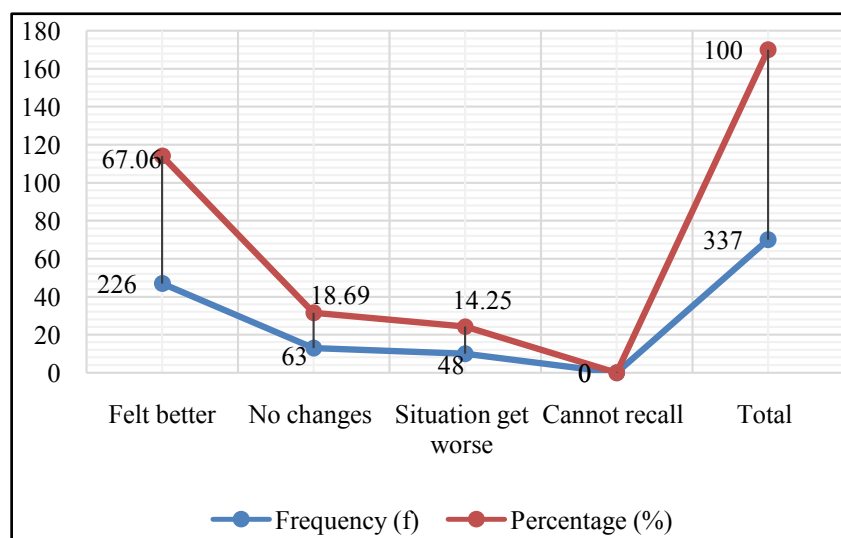
Figure 6. Distribution with regards on the outcome after auto medication.

This could be due to the fact that the practice of auto medication varies across ages, the younger the person is, the higher the tendency of auto medication. This finding is consistent with other studies [17] [18]. This can also be due to the fact that the women are in their active reproductive age. The results of the current study showed that, the prevalence of auto-medication among pregnant women is 337 (67.4%); this result is in line with reports from other studies in Ethiopia [13] and Nigeria [4], where 69.4% and 72.4% were recorded respectively. The prevalence (67.4%), recorded in this study is higher than reported by Alonso-Castro *et*

al., 2018 [6] and Mohseni *et al.*, 2018 [1], where prevalence of 21.9% and 32% were recorded respectively, these difference could probably be due to the fact that our study included both allopathic and herbal medicines for auto-medication but other studies included either of them .This research revealed that 48.07% of respondents had attained at least secondary education. This is in line to findings from Nigeria [4] and Ethiopia [13], which reported that majority of the pregnant women in their research had attained at least secondary education. The educational level of respondents is significant since some studies have suggested a link between education and the probability for self-medication. However, given the sensitivity and risks of auto-medication during pregnancy, 67.4% is a high rate and serious initiatives should be taken into account by authorities and health systems managers as well as families, in turn, in order to prevent and reduce the issues like fetal abnormalities wastage of resources, increased resistance of microbes, inaccurate self-diagnosis, failure to seek timely medical advice and other side effects in pregnancy due to auto-medication [19]. From our finding auto-medication was predominant during the first trimester 246 (72.86%) of pregnancy, this result contrasts with the observation by Jambo *et al.*, 2018 in Ethiopia [13], where self-medication was dominant during the third trimester of pregnancy. This could be due to the fact that during antenatal, pregnant women were educated by health practitioners on what medication to best consume and those that might cause harm to both her and fetus based on the various stages of pregnancy and in developing countries most pregnant women start antenatal during the second trimester of pregnancy. Based on the types of drug used, self-medication was classified self-medication with allopathic medicines and self-medication with herbal medicines. In this study; our finding reported that 96 (28.48%) antiemetic, 72 (21.36%) analgesics and 58 (17.21%) antacids were the most frequent drugs used for auto-medication, this result is partly in line with reports by Yusuff *et al.*, 2011 in Nigeria [20], where analgesics (paracetamol), vitamins and hematinics accounted for 68.1% of these medicines. This result is in contrary with reports from similar studies in Cameroon by Elvis *et al.*, in 2019 [16], where auto-medication with antimicrobials gave a prevalence of 68.4%. This difference could probably be due to the fact majority of respondents have knowledge of potential adverse effects of antibiotics to avoid during pregnancy. Prolonged use of analgesics (paracetamol) during pregnancy is associated to respiratory (asthma), neurological (hyperactivity, autism, among others) disorders in newborns [21] [22]. In this study, majority 226 (67.06%) of respondents replied they felt better after auto medication, this result is contrary to report by Elvis *et al.*, 2018, where the prevalence of hospitalization increases after self-medication. In this study, the main symptoms for which pregnant women practice auto-medication were: fever/headache, constipation and nausea/vomiting. This result is similar to studies carryout in Ethiopia [13] and Eastern DR Congo [15], where cold .headache and nausea/vomiting were among the main symptoms for which the pregnant women practiced auto-medication. This result is contrary to report in the world [1], where the most important group of disease in which

pregnant women self-medicated was anemia. These ailments are considered as minor ailments (fever/headache, constipation, anemia and nausea/vomiting) related to pregnancy and it is better to consult her doctor before proceeding to take any medications [6]. In this study, previous experience, they did not have money for consultation, non-severity of ailments and high cost of medication in hospital/pharmacy was the most common reason pregnant women auto medicate. This result is in line with reports from other studies in the field of auto-medication [6]. Findings from our study revealed that 116 (34.42%) friends/family/neighbours were the main source of recommendation in auto medication. This finding is in line with report from Turkey [23] and Ethiopia [13], where information provided by friends/family/ neighbours about the use of herbal medicine and/or conventional medicine may be insufficient to advise about potential toxic effects for the mother and child. Our findings show that 96 (28.49%) of the 337 participants who accepted to have taken drugs without prescription, self-medicate with local herbs and this habit is generally rampant among Cameroonian and is consist with other studies [20]. This result is less than 58.2% reported by Jambo *et al.*, 2018 in Ethiopia [13], this difference is probably due to availability of herbs and cultural differences among study participants. Majority of our respondent that self-medicate do not take herbal medicine, this might be due the fear of harms to their fetus, considering it as an undesirable practice, lack of information about herbal medicine, fear of contaminations, mislabeling and there isn't a standardized dose for used. The most commonly used herbs in our study were 40 (41.66%) blood leaves (iron supplement), 20 (20.83%) masepo, 20 (20.83%) fever grass and 10 (10.41%) guava/pawpaw leaf. 40 (41.66%). Blood leaves (iron supplement) was the most used herbs in our study, this could be due to the fact that during pregnancy, women suffer from shortage of blood (anemia) which is similar to a study carry out in Nigeria [4], where prevention of anemia was a call of consent.

5. Conclusion

Self-medication might increase maternal mortality and damage to fetus. This finding showed that self-medication is a common practice among pregnant women in our community and Cameroon at large. Adequate counselling of pregnant women by healthcare professionals about the potential risks of self-medication with herbal medicine and allopathic drugs during pregnancy is strongly warranted. In order to achieve the millennium development goal aimed at reducing child and maternal mortality, there is need to upgrade healthcare facilities and embark on regular massive enlightenment campaigns, especially in rural areas to encourage increased healthcare services utilization. In addition, healthcare providers, especially those that are involved in antenatal care should be aware of evidence regarding potential benefits or harm of herbal and conventional medicine when used by pregnant women. There is a need for education of the public on the danger of self-medication and the potential harmful effect on the unborn child. This will ensure attitudinal change and encourage safer practice.

What Is Already Known on This Topic?

- Today, self-medication is now one of the greatest health's, economic and social problems in different societies, including Cameroon;
- Auto-medication during pregnancy is associated with adverse effects and lack of knowledge and little information of mothers about use of drugs, could be harmful for the family and society.

What This Study Adds

- Adequate education of pregnant women during antenatal care on the potential danger of auto medication is necessary;
- There is a high prevalence of auto-medication among pregnant women.

Authors' Contributions

TPB and NFA conceived and designed the study; TPB, ASK, MAA, SBN and NFA conducted the study; WJK, NCT, ZBF, ANA and NFA performed data analysis and interpretation; TPB, and NFA wrote the first draft of the manuscript and ANA, WJK, ASK, ANA, SBN reviewed and corrected the manuscript. SBN, TPB, WJK constituted the questionnaire for the study. SBN, NFA, ANA, MAA did proofreading and inputting of data into Excel sheet. All authors approved the final copy.

Funding

No external funding was gotten for this work.

Acknowledgements

We are grateful to all pregnant women who participated in this research.

Conflicts of Interest

The authors declare no competing interest.

References

[1] Mohseni, M., Azami-Aghdash, S., Gareh Sheyklo, S., Moosavi, A., Nakhaee, M., Pournaghi-Azar, F. and Rezapour, A. (2018) Prevalence and Reasons of Self-Medication in Pregnant Women: A Systematic Review and Meta-Analysis. *IJCBNM*, **6**, 272-284.

[2] World Health Organiztion [WHO] (2018) The Role of the Pharmacist in Self-Care and Self-Medication, 1998. http://apps.who.int/medicinedocs/pdf/whozip32e/whozip32e.pdf

[3] Shafie, M., Eyasu, M., Muzeyin, K., Worku, Y. and MartõÂn-AragoÂn, S. (2018) Prevalence and Determinants of Self-Medication Practice among Selected Households in Addis Ababa Community. *PLoS ONE*, **13**, e0194122. https://doi.org/10.1371/journal.pone.0194122

[4] Abasuibong, F., Bassey, E.A., Udobong, J.A., Akinbami, S.O., Udoh, S.B. and Idung, A.U. (2012) Self-Medication: Potential Risk and Hazard among Pregnant Women in Uyo, Nigeria. *Pan African Medical Journal*, **13**, 15.

[5] Joseph, B., Ezie, I., Aya, B. and Dapar, M. (2017) Self-Medication among Pregnant Women Attending Ante-Natal Clinics in Jos-North, Nigeria. *IJTDH*, **21**, 1-7. https://doi.org/10.9734/IJTDH/2017/28248

[6] Alonso-Castro, A.J., Ruiz-Padilla, A.J., Ruiz-Noa, Y., Alba-Betancourt, C., Domín- guez, F., Ibarra-Reynoso, L.D.R., Maldonado-Miranda, J.J., Carranza-Álvarez, C., Blanco-Sandate, C., Ramírez-Morales, M.A., Zapata-Morales, J., Deveze-Álvarez, M.A., Mendoza-Macías, C.L., Solorio-Alvarado, C.R. and Rangel-Velázquez, J.E. (2018) Self-Medication Practice in Pregnant Women from Central Mexico. *Saudi Pharmaceutical Journal*, **26**, 886-890. https://doi.org/10.1016/j.jsps.2018.03.008

[7] Ahmad, A., Patel, I., Mohanta, G.P. and Balkrishnan, R. (2014) Evaluation of Self-Medication Practices in Rural Area of Town Sahaswan at Northern India. *Annals of Medical and Health Sciences Research*, **4**, S73-S78. https://doi.org/10.4103/2141-9248.138012

[8] Bagheri, A. and Abbaszadeh, F. (2014) Self-Medication and Supplement Use by Pregnant Women in Kashan Rural and Urban Areas. *Journal of Mazandaran University of Medical Sciences* (*JMUMS*), **24**, 151-157.

[9] Befekadu, A., Dhekama, N.H. and Mohammed, M.A. (2014) Self-Medication and Contributing Factors among Pregnant Women Attending Antenatal Care in Ethiopia: The Case of Jimma University Specialized Hospital. *Medicine Science*, **3**, 969-981. https://doi.org/10.5455/medscience.2013.02.8098

[10] World Self-Medication Industry (WSMI) (2010) The Story of Self-Care and Self-Medication: 40 Years of Progress, 1970-2010. Ferney-Voltaire.

[11] Elong Ekambi, G.-A., Okalla, E.C., Penda, I.C., Nnanga Nga, E., Mpondo, M.E. and Eboumbou, M.C.E. (2019) Knowledge, Practices and Attitudes on Antibiotics Use in Cameroon: Self Medication and Prescription Survey among Children, Adolescents and Adults in Private Pharmacies. *PLoS ONE*, **14**, e0212875. https://doi.org/10.1371/journal.pone.0212875

[12] Bayisa, B., Tatiparthi, R. and Mulisa, E. (2014) Use of Herbal Medicine among Pregnant Women on Antenatal Care at Nekemte Hospital, Western Ethiopia. *Jundishapur Journal of Natural Pharmaceutical Products*, **9**, e17368. https://doi.org/10.17795/jjnpp-17368

[13] Jambo, A., Mengistu, G., Sisay, M., Amare, F. and Edessa, D. (2018) Self-Medication and Contributing Factors among Pregnant Women Attending Antenatal Care at Public Hospitals of Harar Town, Ethiopia. *Frontiers in Pharmacology*, **9**, 1063. https://doi.org/10.3389/fphar.2018.01063

[14] Emmanuel, A., Achema, G., Afoi, B.B. and Maroof, R. (2014) Self Medication Practice among Pregnant Women Attending Antenatal Clinic in Selected Hospitals in Jos, Nigeria. *International Journal of Nursing and Health Science*, **1**, 55-59.

[15] Mbarambara, P.M., Songa, P.B., Wansubi, L.M., Mututa, P.M., Minga, B.B.K. and Bisangamo, C.K. (2016) Self-Medication Practice among Pregnant Women Attending Antenatal Care at Health Centers in Bukavu, Eastern DR Congo. *International Journal of Innovation and Applied Studies*, **16**, 38-45.

[16] Amin, E.T., Charles, N., Fondugallah, J.A., Fualefac, A. and Njunkeng, P.A. (2019) Prevalence of Antimicrobial Self-Medication among Patients Attending Two Hospitals in the Buea Health District, Cameroon. *Archives of Community Medicine and Public Health*, **5**, 24-28. https://doi.org/10.17352/2455-5479.000048

[17] Kulkarni, P.K., Khan, M. and Chandrasekhar, A. (2012) Self-Medication Practices among Urban Slum Dwellers in South Indian City. *International Journal of Pharma and Bio Sciences*, **3**, 81-87.

[18] Baig, S. (2012) Self-Medication Practices. *The Professional Medical Journal*, **19**, 513-521.

[19] Ebrahimi, H., Atashsokhan, G., Amanpour, F. and Hamidzadeh, A. (2017) Self-Medication and Its Risk Factors among Women before and during Pregnancy. *Pan African Medical Journal*, **27**, 183. https://doi.org/10.11604/pamj.2017.27.183.10030

[20] Yusuff, K.B. and Omarusehe, L.D. (2011) Determinants of Self-Medication Practices among Pregnant Women in Ibadan, Nigeria. *International Journal of Clinical Pharmacy*, **33**, 868-875. https://doi.org/10.1007/s11096-011-9556-4

[21] Toda, K. (2017) Is Acetaminophen Safe in Pregnancy? *Scandinavian Journal of Pain*, **17**, 335-446. https://doi.org/10.1016/j.sjpain.2017.09.007

[22] Bremer, L., Goletzke, J., Wiessner, C., Pagenkemper, M., Gehbauer, H.B., Tolosa, E., Hecher, K., *et al.* (2017) Paracetamol Medication during Pregnancy: Insight on Intake, Frequencies, Dosage and Effects on Hematopoetic Stem Cell Population in Cord Blood from a Longitudinal Prospective Pregnancy Cohort. *EbioMedicine*, **26**, 146-151. https://doi.org/10.1016/j.ebiom.2017.10.023

[23] Kissal, A., Cevik, G.U. and Batkin, E.D. (2017) Use of Herbal Product among Pregnant Women in Turkey. *Complementary Therapies in Medicine*, **30**, 54-60. https://doi.org/10.1016/j.ctim.2016.11.001

List of Abbreviations

BHD: Bamenda Health District.