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ORIGINAL RESEARCH

Socioeconomic Determinants of Health Contributing to the Consumption of Nonprescribed Medicines in Ethiopia

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Background: Social determinants of health are understood as the conditions in which people are born, grow, live, work, and age that shapes health and include a domain of factors. Self-medication is influenced by these socioeconomic factors. This study, aims to quantitatively examine the relationship between these factors and the use of nonprescribed medicines and then identify which of the factors have the highest predictable value in Ethiopia.

Methods: A quantitative, descriptive, cross-sectional, community-based research approach was used to explore the relationship between the dependent and independent variables in Addis Ababa, Ethiopia. Descriptive statistics, cross-tabulations, bivariate and regression analysis were used in the analysis.

Results: A total of 72.2% (n=433) participants were found to have an ever experience of self-medication in their life and 35.7%) (n=214) have the practice in the last two months. Bivariate analysis showed that in the predisposing factors categories: age group (50–59) (p-value=0.034); those who are knowledgeable about all drugs not to be given to nursing mother (p-value=0.006); those who agree on the attitude that they would rather treat themselves than go to the nearest health facility (p-value=0.000) in the enabling factors; those who were satisfied with their financial quality of life (p-value=0.014) and from the need factors; those who perceived their health status as good (p-value=0.000) showed a significant association. Multivariate analysis showed that age, knowledge, attitudes showed statistical significance. Also, quality of life satisfaction of enabling factors and illness in the past two months from need factors had a statistically significant effect as predictors of utilization of nonprescribed medicines.

Conclusion: To strategize for appropriate self-medication, interventions should focus on changing the knowledge, attitude, and perception of the specific sociodemographic factors identified in the study.

Keywords: sociodemographic factors, community, Ethiopia, use of nonprescribed medicines

Background

Social determinants of health (SDH) are understood as the conditions in which people are born, grow, live, work, and age and that shape health and include factors like economic stability, education, health, and health care, the neighborhood and built environment, and the social and community context domain.[1] Actions on SDH are required to reduce inequalities in health.[2] The WHO Global Commission on the Social Determinants of Health (CSDH) identified that inequalities in SDH driven by inequalities in power, money, and resources are driving inequities in health.[3]

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Self-medication (SM) is a component of self-care, which means the responsible selection and use of nonprescribed medicine that is believed to be safe and effective when used as directed including the intermittent or continued use of a medication prescribed by a physician for chronic or recurring disease or symptoms by individuals to treat self-recognized illness or symptoms.[4] It entails the use of drugs without the advice, recommendation, prescription, diagnosis, and supervision of physicians, or the use of any drugs without consultation with health care staff, and based on the self-diagnosis of diseases and their symptoms.[5]

Irresponsible SM or the use of nonprescribed medicines without proper medicine information is associated with several challenges.[6] These include adverse drug reactions, misdiagnosis, use of expired drugs, use of drugs in excessive amounts, prolonged duration of use, drug interactions, a deterioration in health status, the masking of the presence of severe disease, drug interactions, adverse drug reactions, monetary attrition, risk of dependence and abuse, polypharmacy and other toxicological and pharmacological risks.[7–9] In this regard, the risk of antimicrobial resistance and its public health impact is also an additional issue.[10–16]

On the contrary, SM or the use of nonprescribed medicine is a behavioral response of individuals to promote or restore their health and encourage self-care and has advantages that include saving scarce medical resources, reducing absenteeism from work, reducing pressure on available medical services, and increase availability of health care populations in rural areas.[6,17,18]

Several pieces of evidence have shown that SM practice is influenced by sociodemographic factors, which include level and field of education, economy, job status advertisements, advice from relatives or friends, availability of pharmacies, mobile applications, self-knowledge and previous prescriptions by doctors or experience with a drug to treat similar illness.[19–25] Hence understanding the socioeconomic characteristics of SM is essential to inform public policy aimed not only at deterring undesirable SM and promoting the quality of responsible SM, but also at promoting equitable access to medical care.[26–28]

Like all the other developed and developing countries, the use of medicines that are not prescribed or SM are being practiced in Ethiopia and the prevalence is evidenced in specific population groups, pregnant mothers[29] and students[30] and across different settings studied ranging from 12.8% to 77.1%.

However, there are no studies in the country that investigated the use of nonprescribed medicines and their relationship with socioeconomic factors. Therefore, the objective of this study is to fill this gap first by examining the relationship between the socioeconomic determinants and the use of nonprescribed medicines and second by identifying which of the factors have the highest predictable value. The findings will contribute to the available body of knowledge about the individual users which will then enable the health-care system to design interventions.

Methods

A quantitative, descriptive, cross-sectional, community-based research approach was used to explore the prevalence of the use of nonprescribed medicines in the last two months including their ever use and the predictor effect of socioeconomic factors in a sample of 600 participants selected through multistage sampling method.

The study population is the community of Yeka sub-city Addis Ababa, Ethiopia. Inclusion and exclusion criteria were set and those under 18 years of age, that are incapable of hearing and speaking, that have mental health problems, and those who were unwilling to participate were not included in the study.

The sample size was calculated using the single population proportion formula and the 38.6% average prevalence reported in the systematic review.[31]

$$n = \frac{(Z_{a/2})^2 \times P(1-P)}{d^2} \times de$$

Where n is the sample size; Zα/2 is the standard normal distribution value at the 95% confidence interval level, which is 1.96; P is the proportion of SM, (38.6%); d is the margin of error taken as 5%; de is the design effect for using multistage sampling taken as 1.5. The final sample size used for the research was 600 households with 10% considered contingency.

Sampling was carried out in three phases. In phase one of the process, six districts (woredas in local language) were selected by simple random sampling method from the total 14 weredas available in the Yeka sub-city. Those selected were weredas 1, 2, 3, 6, 8, and 12. In phase two, the sample allocated for each of the six weredas was allocated by distributing the total sample size (n=600) proportionally to the total number of people in each wereda (Table 1). The calculation of the sample allocated to

Table 1 Number of Samples Allocated for Each Wereda (n=600)

Number of Weredas	Total Population Number	Sample Number Allocated
Wereda 1	33,569	100
Wereda 2	39,340	117
Wereda 3	19,027	56
Wereda 6	25,012	74
Wereda 8	25,650	76
Wereda 12	59,588	177

each wereda was obtained by using the following formula as follows.[31,32]

$$N = \frac{Number\ of\ the\ population\ at\ each\ wereda}{Total\ number\ of\ population\ at\ the\ six\ weredas} \times 600$$

In phase three of the sampling process, subjects were selected to participate in the study using the house number of the households, which was obtained from the administrative offices of each wereda, as a sampling frame. Each household was then selected through a systematic random sampling method to be the candidate for the study. The adult participants in the selected household were briefed about the objective of the study, requested for their consent and when they agreed, they were provided with a consent form and their signature was obtained.

Data were collected using a structured interview-based questionnaire which was originally developed for this study based on the conceptual framework for this research as well as the review of the literature. Data collection was carried out in February 2019. Reliability and validity of the data collection tool were ensured through pretest in 30 individuals in the wereda 13 of which were not selected for the actual study, modifications were done based on the result of the pretest. Content validity and construct validity tests were performed using Cronbach's alpha testing method. Data collection tool was also commented by five pharmacists and corrections were made accordingly. Collected data was cleaned before analysis.

Ethical clearance was obtained from the UNISA Health Studies Research Ethics Committee (Ethical clearance number is HSHDC/876/2018 and and from the Addis Ababa Regional Health Bureau Ethics Review Committee for the conduct of the survey. The study was conducted in accordance with the Declaration of Helsinki maintaining ethical principles for medical research on humans.

Data were coded and analyzed using the Statistical Package for Social Sciences (SPSS) version 25. Data analysis included descriptive statistics and cross-tabulations. The relationship between the dependent and independent variables was compared using the chi-square d test and regression analysis. The level of statistical difference was set at $p<0.05$. The hypothesis in the test was the null hypothesis (H_0) that the predictors/socioeconomic factors did not have any effect on the utilization of nonprescribed medicines.

Regarding the assessment of the knowledge response of the study, a three-scale knowledge category of nonprescribed medicine consumption was established. Respondents were asked to reply (yes or no) to 11 questions. A score of 1 was allocated for every correct answer provided and a score of 0 was allocated for any wrong answer provided or any correct statement left unanswered. During analysis, the summation of the scores in this question item was calculated to a maximum of 11 for each respondent; and plotted on a normal distribution curve to determine the mean
(x_k) knowledge score and standard deviation (s_k). The knowledge of nonprescribed medicines among the respondents was then categorized as "good" for those who lie above ($x_{k+}s_k$); "average" for those within ($x_k \pm s_k$); and "poor" for those below ($x_k - s_k$) on the normal distribution curve.[33,34]

Respondents' attitude towards SM was assessed using seven statements rated on a Likert grading on a three-point scale which was scored as agree=1; neutral=2; disagree=3. The minimum score obtainable was nine and the maximum 27. The midpoint (18) was used as the cutoff. A score of 0–17 was graded as negative attitude whereas ≥18 was graded positive attitude.[4] A similar analysis was used for the perception of the safety of SM items in that, the minimum score obtainable was three and the maximum nine. The midpoint (6) was used as the cutoff. The findings of the empirical data together with the reviewed literature were used to provide recommendations.

The understanding of the effect of socioeconomic factors of health on health-care service utilization (self-medication/SM in this study) is best explained by Anderson's Behavioural Model and hence the whole research was guided by it. According to Anderson's conceptual framework, an individual's access to and use of health services and health-seeking behavior is considered to be a function of three characteristics: predisposing, enabling, and need factors.[35]

Dependent Variable

For the purpose of this research, SM or the use of nonprescribed medicine was the self-reported treatment of common health problems by the study participants with modern and/or traditional medicines without direct medical or traditional healer supervision or intervention in the past two months before the study. In addition, SM was used interchangeably with the use of nonprescribed medicines throughout the document.

Independent Variable

The socioeconomic factors of health that were believed to contribute to the health-seeking behavior (self-medication) and investigated were defined as follows:

- Predisposing factors were: age, sex, marital status, knowledge about SM attitude about SM, education, occupation, ethnic religion, SM if you know someone has taken it before, SM if it has been taken before, SM if the medicine is available at home, having no trust in the health-care service, having an old prescription at home, knowing the name of the medicine to buy, having a similar experience of the illness previously, the influence of family/friends who have taken the medicine before, and having the medicine at home.
- Knowledge on SM (how medications are used and various negative effects of medicines), attitude on SM, and perception on safety.
- Enabling factors: income, employment status, health insurance, and quality of life.
- Need factors: illness in the previous two months, presence of chronic disease, and self-reported health status.

Results and Discussion

Sociodemographic Characteristics

A total of 600 respondents from the six woredas participated in this study with a 100% respondent rate. Table 2 presents the distribution of the respondents by the sociodemographic characteristics.

Respondents aged (30–39) were 28.3% (n=170), 81.2% (n=487) were female, 62.3% (n=374) were married, 79.7% (n=478) of them were Orthodox Christians, 55% (n=330) were from Amhara ethnic group and at the time of the survey, the highest educational status attained by the participants was primary school 31.2% (n=187).

Table 2 Sociodemographic Characteristics of the Respondents (n=600)

	Frequency	Percent
Age		
18–29	127	21.2
30–39	170	28.3
40–49	126	21
50–59	80	13.3
>60	97	16.2
Gender		
Male	113	18.8
Female	487	81.2
Marital status		
Unmarried	94	15.7
Married	374	62.3
Divorced	51	8.5
Widowed	81	13.5
Highest educational status		
No formal education	131	21.8
Primary school	187	31.2
High school	141	23.5
Diploma	84	14.0
Degree	53	8.8
Postgraduate degree	4	0.7
Family status		
1–4 inhabitants	355	59.2
5–8 inhabitants	219	36.5
>9 inhabitants	26	4.3
Household responsibility		
Mother	433	72.2
Father	71	11.8
Child	80	13.3
Relative	16	2.7
Health insurance		
Community based	26	4.3
Employment based	38	6.3
I have no insurance	536	89.3
Monthly income (Ethiopian birr)		
Low income: 100–2000	288	48
Middle income: 2001–4000	147	24.5
High income: 4000–6000	89	14.8
The highest income: >6000	76	12.7
Ethnicity		
Amhara		55
Gamo		0.2
Gurage		7.5
Hadiya		1
Kembata		0.2
Oromo		22.7

(*Continued*)

Table 2 (Continued).

	Frequency	Percent
Refused to answer		5.8
Sidama		0.2
Silte		1.2
Tigre		5.5
Wolayita		0.8
Total	**600**	**100.0**

Table 3 Occupational Status of the Respondents (n=213)

Occupation	Frequency	Percentage
Manager	14	6.6
Professional	61	28.6
Clerical job	21	9.9
Sales and services	43	20.2
Skilled laborer	41	19.2
Unskilled laborer	33	15.5
Total	**213**	**100.0**

Regarding family status, 59.2% (n=355) of the respondents have 1–4 inhabitants living in the same house. Most of the respondents 72.2% (n=433) were mothers in their household responsibility. The majority of the participants 89.3% (n=536) had no health insurance, 50.7% (n=304) were housewives and out of those employed (n=213), 28.6% (n=61) were professionals (Table 2) (Table 3) (Figure 1).

The household income of the respondents ranged from Ethiopian birr 100 to 23,000 indicating a wide range between the two extremes of household income. According to Kothari and Garg,[33] the distribution of the monthly household income of the respondents was asymmetrical and the income distribution were right-skewed

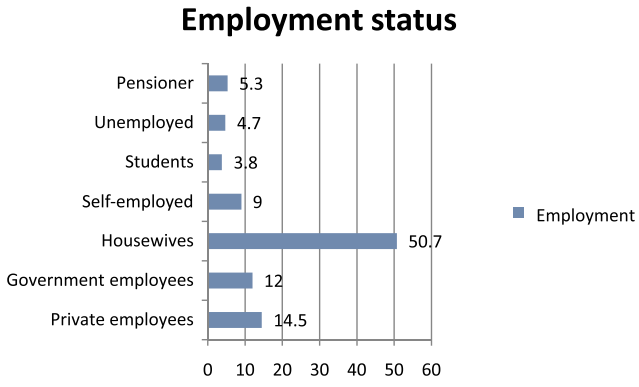

Figure 1 Bar graph of percentage of employment history of respondents (n=600).

Table 4 Characteristics of the Health Status of the Respondents

	Frequency	Percentage
Health Status		
Very good	267	44.5
Good	173	28.8
Average	135	22.5
Poor	25	4.2
Illness in the past two months		
Yes	263	43.8
No	337	5

(coefficient of skewness=2.045) and has a thin distribution (coefficient of kurtosis=5.810). The median annual household income was Ethiopian birr 2500. The monthly income of the respondents was divided into four income groups (Table 2). Based on the income grouping, 48% (n=288) of the respondents were categorized into the lower-income group, 24.5% (n=147) in the middle groups and 14.8% (n=89) in the high-income group and 12.7% (n=76) were categorized into the highest income group.

As indicated in Table 4, 44.5% (n=267) of the respondents were in a very good health status at the time of the survey, 28.8% (n=173) in a good health status, 22.5% (n=135) in average health status and 4.2% (25) of the participants said that they have poor health status. As to any illness in the past two months, 43.8% (n=263) responded by saying that they were ill in the past two months before the survey and 56.2% (n=337) said they were not.

Knowledge of Self-medication

As described in the methods part, the maximum score of the knowledge was calculated. Out of a total score of 11, the mean score for knowledge of SM among respondents was 8.1 (SD ±2.328). In addition, only 16.3% of the respondents had good knowledge of SM, 70.3% had average knowledge and 13.3% had poor knowledge of SM.

In addition, specific questions on knowledge (Table 5) indicated that 61.2% (n=367) of the participants were not knowledgeable about the type of information that should be available while self-medicating. In contrast, 47.8% (n=287) were not knowledgeable about the presence of drugs that should not be simultaneously taken with other drugs which is slightly higher than the observations in a recent study[36] (37.3%). This difference could be due to the variation in the study setting and

Table 5 Description of Specific Questions on Knowledge of Self-medication (SM)

Question	Knowledge of Respondents (Percentage)	
	Knowledgeable	Not Knowledgeable
Do you know how to store medicine at home?	73.8	26.2
What type of information should be available during taking SM?	38.8	61.2
There are some drugs that should not be simultaneously taken with other drugs	52.2	47.8
Some drugs cannot be taken with alcoholic drinks.	96.8	3.2
Some drugs cannot be taken with all types of food items.	73.7	26.3
All types of drugs cannot be given to children.	95.3	4.7
All types of drugs cannot be given to pregnant women.	94.3	5.7
All types of drugs cannot be taken by patients having a chronic disease?	50.2	49.8
All types of drugs cannot be taken by nursing mothers	81.2	18.8
Some drugs can be available in different dosage forms	70.8	29.2
The same drug can be a remedy and a poison	82.7	17.3

study population or ample size. Besides, 49.8% (n=299) did not know that all types of drugs cannot be taken by patients having a chronic disease. Moreover, 26.3% (n=158) did not know that some drugs cannot be taken with all types of food items, 26.2% (n=157) did not have the knowledge on how to store medicines at home, and 18.8% (n=113) of the respondents did not know that all types of drugs cannot be taken by nursing mothers.

Attitude on Self-medication

Most of the respondents have a generally positive attitude against SM 89.3% (n=536) and those with a negative attitude against SM amounted to 10.7% (n=64). Considering specific attitude questions, 22.5% (n=135) of respondents agreed that SM should be encouraged, 21.8% (n=131) believed that if the medication helped in the past it will help again and 19% (n=114) believed that they would rather treat themselves than go to the nearest health facility (Table 6).

Quality of Life of Respondents

During the study, participants were asked for their current satisfaction level of quality of life with specific details on their relationship among family friends, colleagues, and others. They were also asked abouttheir achievement and accomplishment; career and profession; ability to cope with their day-to-day activities; financial satisfaction and their living condition in terms of housing. Participants' quality of life was also tested by requesting for the presence of social support ("edir" which is a local name for the gathering of people living in one area and supporting each other during a death in one's family, and ekub, which is a local name for a gathering of a small group of people to support each other through a contribution of money in a regular period and providing it to a member one at a time). The summary of the values obtained indicated that 79.7% (n=478) were satisfied with their quality of life and 20.3% (122) were not.

Table 6 Description of the Attitude of Respondents on Self-Medication (SM)

Questions	Level of Agreement		
	Agree (%)	Neutral (%)	Disagree (%)
Any medication can be used without seeing a health-care professional.	14.2	20.7	65.2
It is okay to share medicine with family or friends without it being prescribed.	8.5	6	85.5
SM should be encouraged.	22.5	19.7	57.8
If medication helped in the past it will help again.	21.8	17.8	60.4
Medication should be used at the sign of the first symptom.	17.3	14.8	67.8
Medicines that are nonprescribed/OTC cause no side effects.	6.8	10	83.2
Safety of nonprescribed medicines/OTC is well-known for all types of population.	4.5	9.2	86.3
I would rather treat myself than go to the nearest health facility.	19	19	62
Many medical problems can be treated with SM.	8.7	19.5	71.8

Use of Nonprescribed Medicines

It was found out that, 72.2% (n=433) have ever experience of SM or prevalence in their lifetime which is a similar finding to the study carried out recently in Ethiopia[37] that identified a 75.5% SM prevalence and Colombia[38] where 77.5% of the sample had self-medicated at least once in their life. In addition, in this study, 214 respondents were identified to have used nonprescribed medicines in the last two months making the prevalence of the use of nonprescribed medicines 35.7%.

As described in Tables 7–table 8, table 9 varied amount of influence of each of the socioeconomic characteristics (predisposing, enabling, and need factors) was established with the dependent variable during the bivariate analysis. Next, those variables that were statistically significant were included in the multivariable regression analysis to determine their predictor effect on the nonprescribed medicines among respondents.

The results of the analysis of the factors affecting the utilization of nonprescribed medicines among respondents are presented in Table 10.

All the 600 respondents were included in the analysis and the −2 log-likelihood was 130.671. The "pseudo" R estimate indicated that the model explained between 47.9% (Cox and Snell R squared) and 66.8% (Nagelkerke R squared) of the variance in the utilization of nonprescribed medicines among the respondents.

In this model, age (p-value=0.039), occupation (p-value=0.005), knowledge (p-value=0.002),attitudes (SM if the medication is at home (p-value=0.011), in all types of illnesses prefer SM (p-value=0.006)} of predisposing factors were the independent variables that had statistically significant effect. In addition, quality of life satisfaction from social support (edir, association, ekub) (p-value=0.037), quality of life from financial satisfaction (p-value=0.009) of enabling factors and illness in the past two months (p-value=0.000) from need factors of the were the independent variables that had statistically significant effect as predictors of utilization nonprescribed medicines (Table 10).

The analysis identified that the probability of using nonprescribed medicine was higher for the respondents in the age group (50–59) than (40–49) and (30–39) compared to the reference group (18–29). The odds, adjusted odds ratio (AOR) for the use were 5.809, 4.713, and 4.351 respectively. This positive effect of age toward the utilization of nonprescribed medicines corroborates the findings of a study conducted in urban Puducherry, India[38] (p-value=0.006) and the case study of Kiambu County, Kenya.[6] These studies identified that if the age of the person increases by unit she/he is 1.02054 times likely to self-medicate when all other variables are at reference levels with the effect being statistically significant.

The occupation professional was also indicated to be the major factor in the consumption of nonprescribed medicines compared to the reference group with marked significance (AOR=10.777, p-value=0.003) in the multivariable regression analysis. This finding resonates with the findings obtained in the study carried out in urban Puducherry, India[39] with a statistically significant association (p-value=0.003) and that of Minia, Egypt (p--value=0.003).[40] Those respondents who were ill during the past two months were found to be significantly self-medicating as compared to those who were not (p-value=0.000). Respondents who have a practice of using nonprescribed medicine because the medicine is available at home were also identified to be a statistically significant predictor in their use of nonprescribed medicines (AOR=5.275, p-value=0.011).

Similarly, the regression model indicated that those respondents who provided a positive response towards preferring SM in all types of illnesses presented a significant effect on the use of nonprescribed medicines (AOR=5.214, p-value=0.006). Regarding the level of quality of social relationships (satisfaction with their social support, edir, association and ekub), those respondents with neutral responses were found to be lower in using nonprescribed medicines compared to the reference group which was dissatisfied with their quality of social relationship (AOR=0.100 p-value=0.037). On the contrary, those respondents with a satisfactory level of quality of life in terms of financial capabilities were identified to be strongly predicting the use of nonprescribed medicines (AOR=8.047, p-value=0.002).

The model indicated that those participants who were knowledgeable if all drugs cannot be given to nursing mothers were found to be statistically significant (AOR=6.058, p-value=0.002). Just as the effect observed in the bivariate analysis, the age group (50–59) was found to be the predictor of nonprescribed medicine in the multivariable regression analysis. On the contrary, the age group (>60) was not identified to be the predictor when analyzed in the multivariable regression analysis.

Table 7 Association of Predisposing Factors with the Use of Nonprescribed Medicines (n=600)

Enabling Factors	B	SE	Wald	df	Sig.	Exp(B)/ COR	95%CI for Exp (B)	
							Lower	Upper
Age								
18–29 (reference)			18.042	4	0.001			
30–39	−0.122	0.250	0.239	1	0.625	0.885 (0.542–1.445)		
40–49	−0.366	0.276	1.762	1	0.184	0.693 (0.404–1.191)		
50–59	0.620	0.292	4.506	1	0.034	1.858 (1.049–3.293)		
>60	0.566	0.277	4.194	1	0.041	1.762 (1.025–3.030)		
Employment status								
Private employee (reference)			12.269	6	0.056			
Government employee	−0.128	0.342	0.139	1	0.709	0.880 (0.450–1.721)		
Housewife	0.025	0.258	0.009	1	0.924	1.025 (0.618–1.698)		
Self-employed	0.000	0.368	0.000	1	1.000	1.000 (0.487–2.055)		
Student	0.606	0.475	1.626	1	0.202	1.833 (0.722–4.654)		
Unemployed	0.258	0.449	0.330	1	0.566	1.294 (0.537–3.119)		
Pensioner	1.204	0.430	7.833	1	0.005	3.333 (1.435–7.746)		
Occupation								
Unskilled laborer (reference)			12.846	5	0.025			
Manager	−1.486	0.841	3.123	1	0.077	0.226 (0.044–1.176)		
Professional	0.075	0.436	0.029	1	0.864	1.078 (0.458–2.535)		
Clerical	−2.690	1.084	6.165	1	0.013	0.068 (0.008–0.567)		
Sales and services	−0.218	0.473	0.212	1	0.645	0.804 (0.318–2.032)		
Skilled laborer	−0.826	0.506	2.662	1	0.103	0.438 (0.162–1.181)		
Marital status								
Unmarried (reference)			10.700	3	0.013			
Married	0.082	0.249	0.108	1	0.743	1.085 (0.666–1.768)		
Divorced	0.768	0.358	4.595	1	0.032	2.155 (1.068–4.349)		
Widowed	0.683	0.315	4.698	1	0.030	1.981 (1.068–3.675)		
Educational status								
Postgraduate degree (reference)			11.221	5	0.047			
No formal education	−0.482	0.237	4.158	1	0.041	0.617 (0.388–0.981)		
Primary education	−0.532	0.254	4.372	1	0.037	0.588 (0.357–0.967)		
High school	0.053	0.282	0.035	1	0.851	1.054 (0.607–1.832)		
Diploma	−0.546	0.347	2.471	1	0.116	0.579 (0.293–1.144)		
Degree	1.391	1.168	1.417	1	0.234	4.018 (0.407–39.656)		
Family status								
<4 inhabitants (reference)			5.211	2	0.074			
5–9 inhabitants	0.395	0.178	4.916	1	0.027	1.484 (1.047–2.103)		
>9 inhabitants	−0.075	0.440	0.029	1	0.864	0.928 (0.392–2.196)		
SM if the medication is available at home (Yes) (reference No)	1.910	0.219	75.826	1	0.000	6.756 (4.395–10.386)		
SM if you know someone who has taken it before (Yes) (reference No)	1.548	0.183	71.336	1	0.000	4.702 (3.283–6.735)		
SM if you have taken the medication previously (Yes) (reference No)	1.503	0.190	62.553	1	0.000	4.496 (3.098–6.525)		
Recommend to someone who has similar symptom (Yes) (reference No)	1.399	0.203	47.681	1	0.000	4.051 (2.723–6.026)		
In all types of illness prefer SM (Yes) (reference No)	1.329	0.181	54.050	1	0.000	3.777 (2.650–5.382)		
Knowledge, how to store medicine (knowledgeable) (not knowledgeable reference)	0.405	0.190	4.525	1	0.033	0.667 (0.459–0.969)		

(*Continued*)

Table 7 (Continued).

Enabling Factors	B	SE	Wald	df	Sig.	Exp(B)/ COR	95%CI for Exp (B)	
							Lower	Upper
Knowledge, all types of drugs cannot be given to nursing mothers (knowledgeable) (not knowledgeable reference)	0.581	0.212	7.544	1	0.006	0.559 (0.369–0.847)		
Attitude, any medication can be used without seeing a health-care professional (disagree reference)			9.171	2	0.010			
Attitude, any medication can be used without seeing a healtcare professional (agree)	0.696	0.243	8.229	1	0.004	2.006 (1.247–3.229)		
Attitude, any medication can be used without seeing a health-care professional (neutral)	0.341	0.213	2.557	1	0.110	1.407 (0.926–2.137)		
Attitude, SM should be encouraged (disagree reference)			20.085	2	0.000			
Attitude, SM should be encouraged (agree)	0.858	0.210	16.788	1	0.000	2.359 (1.565–3.557)		
Attitude, SM should be encouraged (neutral)	0.660	0.221	8.924	1	0.003	1.934 (1.255–2.981)		
Attitude, medication that helped in the past will help again (disagree reference)			12.260	2	0.002			
Attitude, medication that helped in the past will help again (agree)	0.643	0.210	9.402	1	0.002	1.902 (1.261–2.869)		
Attitude, medication that helped in the past will help again (neutral)	0.560	0.226	6.114	1	0.013	1.750 (1.123–2.728)		
Attitude, medication should be used at the sight of the first symptom (disagree reference)			7.643	2	0.022			
Attitude, medication should be used at the sight of first symptom (agree)	0.525	0.224	5.475	1	0.019	1.690 (1.089–2.623)		
Attitude, medication should be used at the sight of first symptom (neutral)	0.462	0.239	3.734	1	0.053	1.588 (0.993–2.537)		
Attitude, I would rather treat myself than go to the nearest health facility (disagree reference)			32.929	2	0.000			
Attitude, I would rather treat myself than go to the nearest health facility (agree)	1.198	0.222	29.262	1	0.000	3.315 (2.147–5.117)		
Attitude, I would rather treat myself than go to the nearest health facility (neutral)	0.740	0.222	11.131	1	0.001	2.096 (1.357–3.238)		
Attitude, many medical problems can easily be treated with SM (disagree reference)			10.113	2	0.006			
Attitude, many medical problems can easily be treated with SM (agree)	0.687	0.296	5.374	1	0.020	1.987 (1.112–3.551)		
Attitude, many medical problems can easily be treated with SM (neutral)	0.540	0.213	6.446	1	0.011	1.717 (1.131–2.606)		
Positive perception against safety of SM	−0.750	0.190	15.651	1	0.000	0.473 (0.326–0.685)		
Negative perception against safety of SM (reference)	−0.051	0.159	0.101	1	0.750	0.951		
Safety perception, SM on your own to treat yourself is completely safe (disagree reference)			12.580	2	0.002			
Safety perception, SM on your own to treat yourself is completely safe (agree)	0.674	0.198	11.628	1	0.001	1.962 (1.332–2.890)		
Safety perception, SM on your own to treat yourself is completely safe (neutral)	0.024	0.237	0.010	1	0.920	1.024 (0.644–1.628)		

(*Continued*)

Table 7 (Continued).

Enabling Factors	B	SE	Wald	df	Sig.	Exp(B)/ COR	95%CI for Exp (B)	
							Lower	Upper
Safety perception, SM for family/friends is not dangerous (disagree reference)			11.567	2	0.003			
Safety perception, SM for family/friends is not dangerous (agree)	0.630	0.315	3.996	1	0.046	1.878 (1.012–3.484)		
Safety perception, SM for family/friends is not dangerous (neutral)	0.599	0.194	9.514	1	0.002	1.820 (1.244–2.662)		
Safety perception, SM is safe when used with information from family or friends (disagree reference)			14.881	2	0.001			
Safety perception, SM is safe when used with information from family or friends (agree)	0.632	0.199	10.046	1	0.002	1.881 (1.273–2.779)		
Safety perception, SM is safe when used with information from family or friends (neutral)	0.719	0.237	9.243	1	0.002	2.053 (1.291–3.263)		

Table 8 Association of Enabling Factors with the Use of Nonprescribed Medicines (n=600)

Enabling Factors	B	SE	Wald	df	Sig.	Exp(B)/ COR	95%CI for Exp (B)	
							Lower	Upper
Quality of life, social support (edir) association and ekub (not satisfied reference)			10.380	2	0.006			
Quality of life, social support (edir) association and ekub (satisfied)	0.783	0.414	3.579	1	0.59	2.188 (0.972–4.925)		
Quality of life, Social support (edir) association and ekub (neutral)	0.129	0.456	0.80	1	0.777	1.138 (0.465–2.783)		
Quality of life, financial satisfaction (not satisfied Reference)			7.700	2	0.021			
Quality of life, financial satisfaction (satisfied)	−0.533	0.218	5.984	1	0.014	0.587 (0.383–0.899)		
Quality of life, financial satisfaction (neutral)	−0.579	0.229	6.371	1	0.012	0.560 (0.357–0.879)		
Income (highest reference)			6.039	3	0.110			
Income (low)	0.422	0.284	2.208	1	0.137	1.525 (0.874–2.662)		
Income (middle)	0.619	0.306	4.088	1	0.043	1.858 (1.019–3.386)		
Income (high)	0.078	0.347	0.050	1	0.822	1.081 (0.548–2.132)		

Table 9 Association of Need Factors with the Use of Nonprescribed Medicines (n=600)

Need Factors	B	SE	Wald	df	Sig.	Exp(B) COR	95%CI for Exp(B)	
							Lower	Upper
Illness in the past two months (Yes) (No reference)	2.059	0.194	112.664	1	0.000	7.839 (5.360–11.465)		
Perceived Health status Poor (reference)			31.165	3	0.000			
Very good	0.123	0.214	0.330	1	0.566	1.131 (0.744–1.719)		
Good	1.014	0.220	21.331	1	0.000	2.757(1.793–4.240)		
Average	1.515	0.438	11.951	1	0.001	4.551(1.927–10.746)		

Table 10 Logistic Regression Model of Nonprescribed Medicines Use (n=600)

	COR		AOR					
	p-value	Exp (B) (95%CI)	B	SE	Wald	df	*p*value	Exp (B) (95%CI)
Age 18–29 (reference)	0.001				10.109	4	0.039	
30–39	0.625	0.885 (0.542–1.445)	1.471	0.634	5.385	1	0.020	4.351 (1.257–15.067)
40–49	0.184	0.693 (0.404–1.191)	1.550	0.783	3.923	1	0.048	4.713 (1.016–21.857)
50–59	0.034	1.858 (1.049–3.293)	1.759	0.881	3.984	1	0.046	5.809 (1.032–32.685)
>60	0.041	1.762 (1.025–3.030)	−0.850	1.142	0.554	1	0.457	0.427 (0.046–4.008)
Occupation (unskilled laborer=reference)	0.025				16.911	5	0.005	
Manager	0.077	0.226 (0.044–1.176)	−1.510	1.306	1.336	1	0.248	0.221 (0.017–2.859)
Professional	0.864	1.078 (0.458–2.535)	2.377	0.806	8.695	1	0.003	10.777 (2.219–52.327)
Clerical job	0.013	0.068 (0.008–0.567)	−1.627	1.456	1.248	1	0.264	0.197 (0.011–3.414
Sales and service	0.645	0.804 (0.318–2.032)	1.536	0.815	3.553	1	0.059	4.648 (0.941–22.963)
Skilled laborer	0.103	0.438 (0.162–1.181)	1.181	0.826	2.048	1	0.152	3.259 (0.646–16.437
Illness in the past two months (Yes) (No=reference)	0.000	7.839 (5.360–11.465)	4.129	0.660	39.100	1	0.000	62.134(17.030–226.696)
SM if the medication is available at home (Yes) (No=reference)	0.000	6.756 (4.395–10.386)	1.663	0.656	6.431	1	0.011	5.275 (1.459–19.073)
In all types of illness prefer SM (Yes) (No=reference)	0.000	3.777 (2.650–5.382)	1.651	0.598	7.635	1	0.006	5.214 (1.616–16.825)
Quality of life, social support (edir) association and ekub (not satisfied reference)			10.380	2	0.006			
Quality of life, social support edir association ekub (neutral) (dissatisfied=reference)	0.777	1.138 (0.465–2.783)	−2.305	1.103	4.371	1	0.037	0.100 (0.011–0.866)
Quality of life, financial satisfaction (dissatisfied=reference)					9.325	2	0.009	
Quality of life, financial satisfaction (satisfied)	0.014	0.587 (0.383–0.899)	2.085	0.704	8.776	1	0.003	8.047 (2.025–31.977)
Knowledge, all types of drugs cannot be given to nursing mothers (knowledgeable) (not knowledgeable=reference)	0.006	0.559 (0.369–0.847)	1.801	0.584	9.513	1	0.002	6.058 (1.928–19.030)
Constant			−8.232	1.497	30.247	1	0.000	0.000

During the bivariate analysis, the independent effect of the variables; marital status, educational status, SM if you know someone who has taken it before, SM if you have taken the medication previously, recommended to someone who has similar symptoms, knowledge on how to store medicines, attitude any medication can be used without seeing a health-care professional, SM should be encouraged, medication that helped in the past will help again, medication should be used at the site of the first symptom, I would rather treat myself than go to the nearest health care facility, many medical problems can easily be treated with SM, safety perceptions, income, and perceived health status were not observed to be significant when they were analyzed controlling for the effect of other independent variables in the regression analysis.

Regarding the relation to the overall fit of the model, the result of the analysis indicated that the null hypothesis (H_0) that the predictors did not have any effect on the utilization of nonprescribed medicines was rejected (chi-squared=139.077, df=20, and *p*-value=0.000, overall correctness of prediction=85.9%). On the contrary, the respondents' age, occupation, knowledge, attitudes, SM if the medication is at home, in all types of illnesses prefer SM, quality of life satisfaction from social support, quality of life from financial satisfaction, illness in the past two

months were the predictors of utilization of nonprescribed medicines (Table 10).

Conclusions and Recommendations

This study concluded that selected socioeconomic factors of individuals in Yeka, Addis Ababa, Ethiopia were predictors of nonprescribed medicines use (model *p*-value=0.000). These factors were age, occupation, knowledge, and attitude as predisposing factors; quality of life satisfaction from social support (edir, association, ekub) and quality of life from financial satisfaction of enabling factors, and illness in the past two months from need factors of the respondents in Yeka, Addis Ababa, Ethiopia.

As obtained from the study, one-third of the population had a practice of nonprescribed medicine consumption in the last two months, two-thirds had an ever experience of nonprescribed medicine use and additionally, individuals have demonstrated their intention to self-medicate when experiencing different ailments. Although the positive aspect of SM in reducing the health service burden needs to be encouraged, it is necessary to strategize for appropriate SM. Therefore, this calls for action to minimize the unnecessary medicine-related harm that may be caused owing to inappropriate use and wastage of limited resources.

Recommendations for the awareness creation programs designed need to focus on changing the knowledge attitude and perception of the specific groups identified to have a predictive effect on the use of nonprescribed medicines. The tailored actions need to focus on age groups (50–59), (40–49) and (30–39); the occupation professionals; the practice of SM if the medicine is available at home; the knowledge that not all drugs can be given to nursing mothers; quality of life satisfaction obtained from social support groups, quality of life obtained from financial satisfaction and illness in the past two months.

Recommendations for the regulatory system are as follows.

- Enforce regulations and guidelines of good dispensing and good counseling practices so that healthcare professionals who are providing nonprescribed medicines at various health sectors can have sufficient knowledge to implement them.
- Revise the over the counter OTC/nonprescribed medicines list that is currently available in the country.
- Establish a continuing education mechanism for the effective utilization of pharmacy professionals towards providing proper diagnosis, treatment, and referral of patients from community drug outlets.
- Establish a special drug consultation service that would be provided by pharmacy professionals to enable consumers to benefit from professional drug consulting services.
- Establish and implement a behind the counter/BTC medication system where certain selected groups of OTC medications are dispensed to the public through a trained and qualified pharmacy professional. The selected nonprescribed medicines will be provided with the appropriate initial assessment and screening, medication reviews, counseling, and medication monitoring to ensure the safety appropriateness and effectiveness of the use of nonprescribed medicines by the public.
- Establish a pharmacy take-back programs where left-over medicines available at home are submitted to pharmacies by the public so that they could be disposed of appropriately.

Limitations of the Study

As the study was conducted at a community level, the individuals' self-evaluation of illness severity and the associated need to seek treatment was not studied. In addition, as the chosen recall period is two months, there was an effect of recall bias. The latter was resolved by the strong effort and efficiency of the interviewing capacity of the data collectors.

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Disclosure

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