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Original Article

Determinants of Self-Medication Among Women of Reproductive Age

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Abstract

Background: Self-medication is a potential risk for women of reproductive age, which can lead to many complications. The purpose of this study was to determine the prevalence and determinants of self-medication prevention behaviors (SMPB) in women of reproductive age based on the health belief model (HBM).

Methods: This cross-sectional study was conducted among 336 individuals randomly selected from those who visited comprehensive health centers in the Salas-e Babajani county, Kermanshah, in western Iran in 2021. Women filled out a self-report questionnaire. The data were analyzed by SPSS-16 software using Pearson correlation and linear regression tests.

Results: The average age of women was 33.24±7.65 years, and their age range was 15–49 years. Further, 59.2% and 100% of participants had used prescription-only (POM) and over-the-counter (OTC) medications in the past three months, respectively. Additionally, 18.7% reported a history of smoking. Age (beta=0.109 and $P=0.040$), susceptibility (beta=0.179 and $P=0.019$), and cues to action (beta=0.440 and $P<0.001$) were all found to be predictors of SMPB. The HBM variables accounted for 47% of the variation in the outcome measure of the SMPB.

Conclusion: The prevalence of self-medication was high. It seems that the development and implementation of perceived susceptibility promotion programs toward the complications of self-medication in women of reproductive age can lead to useful findings in the prevention of self-medication. In addition, health educators should prioritize identifying the key cues to actions that motivate individuals to avoid self-medication. Valuable recommendations from doctors, pharmacists, healthcare professionals, and environmental advertisements can also provide useful insights into self-medication prevention in women of reproductive age.

Keywords: Self-medication, Cues, Health belief model, Women

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Introduction

The World Health Organization defines self-medication as "the selection and use of drugs by individuals to treat self-identified diseases or symptoms", which is widespread worldwide (1-3). Evidence reports the prevalence of self-medication ranging from 27% to 90.1% in different countries worldwide (4).

A widespread public health concern among pregnant women and women of reproductive age is the decision to acquire and use medication without a doctor's prescription (5). In Iran, it has been reported that 68.9% of women of reproductive age engage in self-medication (6). Engaging in self-medication during pregnancy can have serious negative consequences on both the mother's health and the development of the baby (7,8). The Food and Drug Administration has categorized medicines into A, B, C, D, and X groups based on their potential risks during pregnancy; only a few OTC medicines fall into category A or B, indicating no evidence of harm to the fetus. However, a significant number of medicines are classified as category C, implying that they may pose a potential risk to the fetus. Additionally, some medicines are grouped into D or X, indicating a higher risk to the fetus (9). Self-medication in pregnant women

can lead to various side effects, including malformation/teratogenicity, fetal toxicity, low birth weight, premature birth, respiratory problems, intracranial hemorrhage in newborns, and an increased risk of neural tube defects in the fetus (9,10). It is crucial to understand that the impact on fetal development may not be immediately noticeable and can have long-lasting negative effects; therefore, it is highly important to prioritize the safety of medication and prevent self-medication during pregnancy and for women who are capable of bearing children (11).

Improving prevention strategies for self-medication during pregnancy can be achieved by understanding the determinants related to self-medication (12). Utilizing behavior analysis theories and models facilitates our understanding of health-related behaviors and provides goals and strategies for interventionists (13). Theory is an essential criterion for evidence-based health promotion (14). The use of theories has a prominent role in planning health promotion interventions, and the most effective measures of health behavior intervention will be facilitated by the use of theory (15,16). Meanwhile, the health belief model (HBM) is a conceptual framework that proposes constructs to predict and explain health behavior changes; HBM is a widely used framework to describe and predict health behavior (17). It was introduced in the 1950s to understand why individuals engage in behaviors related to disease diagnosis and prevention; the HBM includes various determinants that influence people's decisions to take action in controlling, screening, and preventing health issues; these determinants include how individuals perceive the susceptibility and severity of the condition, the benefits they believe they will gain from taking action, the barriers they perceive in doing so, the cues to action they receive, and their confidence in their ability to succeed (self-efficacy) (18). In the field of healthcare, evidence-based practice has gained extensive importance, as highlighted in the literature; this has led to a surge in research focused on combining existing knowledge related to different health concerns (19). Thus, this study seeks to determine the prevalence and determinants of self-medication prevention behaviors (SMPB) based on HBM.

Materials and Methods

Participants and Study Design

This cross-sectional study was performed in Salas-e Babajani county, located in the western province of Kermanshah, Iran, in 2021. The participants were 336 women of reproductive age who were randomly chosen from those visiting comprehensive health service centers in Salas Babajani. The estimated sample size was 336 individuals, based on a standard deviation of 6.47 from the pilot study, a significance level of 5%, and an error rate of 0.5 units. For this study, women of reproductive age (15–45 years old) who were willing to participate and suffered from no specific diseases (e.g., diabetes, hypertension, or dementia) were considered the inclusion criteria. Before participating, all individuals were fully informed about the study and were required to read and sign a consent form. The study protocol was approved by the Research Ethics Committee of Kermanshah University of Medical Sciences (IR.KUMS.REC.1400.275). Every person who was invited to participate in the study filled out the questionnaire, resulting in a 100% response rate.

Measurements

A questionnaire was used for data collection, and it was tested for validity and reliability to ensure its accuracy. The questionnaire consisted of three sections. The first section gathered background and demographic information, such as age, education level, occupation, economic status, number of children, smoking, health insurance, access to medicine without a doctor's prescription, and storage of medicine at home without a doctor's prescription. The second section examined the self-treatment practices among women, specifically focusing on over-the-counter (OTC) and prescription-only (POM) medications. The third section included items related to HBM determinants. Table 1 provides details on the number of items, sample items, and alpha coefficient for each HBM determinant. The HBM questionnaire was developed based on standard questionnaires used in previous studies to measure self-medication (20-22). Participants responded to the questionnaire using a 5-point Likert-type scale.

In this study, the face validity, content validity, and internal consistency of the questionnaire were evaluated, and the face validity was qualitatively assessed by conducting face-to-face interviews with 12 experts and

Table 1. Items, Sample of Items, and the Alpha Coefficient of Each HBM Determinant

Determinants	Number of Items	Sample	Alpha Coefficient
Susceptibility	4	Awareness of the high costs of medical care and the decline in public health due to self-medication will increase my sensitivity to avoiding self-medication.	0.88
Severity	5	Warning of serious side effects caused by self-medicated use of drugs will lead to non-self-medication.	0.89
Benefits	5	The likelihood of engaging in self-administration decreases if I possess comprehensive knowledge about the potential adverse effects of drug self-administration.	0.81
Barriers	8	Many people resort to self-medication due to a lack of time to visit hospitals or medical centers.	0.83
Cues to action	5	The health center staff gives me accurate information about the side effects of self-medication.	0.89
Self-efficacy	4	I am confident that I can avoid self-medication by regularly visiting the doctor.	0.87
SMPB	7	I do not take medicine without a doctor's prescription.	0.86

Note. HBM: Health belief model; SMPB: Self-medication prevention behavior.

making modifications to the questionnaire based on their opinions. The content validity of the questionnaire was measured using both quantitative and qualitative methods. Overall, 12 experts were interviewed to gather their opinions on the difficulty, relevance, and ambiguity of the questionnaire items, and necessary modifications were made based on their feedback. Additionally, 12 other experts were interviewed to determine the quantitative content validity, categorizing each item as essential, useful but not essential, or unnecessary. In addition, the Lawshe table was used to establish the minimum values for the content validity index and content validity ratio, which were determined to be 0.79 and 0.62, respectively (23). The panel of experts consisted of two health policymakers, four healthcare experts, two doctors, and four experts in health education and promotion. To assess internal consistency, Cronbach's alpha coefficient was utilized to measure different constructs of the HBM. Prior to the main project, a pilot study was conducted on 20 women of reproductive age, who were also participants in the main study. This pilot study aimed to gather feedback on the clarity, comprehensiveness, and completion time of the various instruments, as well as to estimate the internal consistency of these instruments.

Data Analysis

The data were analyzed by SPSS (version 16) using multiple linear regression and Pearson correlation coefficient statistical tests at a 95% significance level. Descriptive information, including frequencies and percentages, as well as means and standard deviations (SD), was used to summarize the data. The correlation between the components of the HBM was measured using the Pearson correlation coefficient. The assumptions of linearity and independence for quantitative outcomes were assessed and confirmed, and multiple linear regression was utilized to identify the predictors of self-medication preventive behaviors (model 1). Variables with a *P* value greater than 0.25 were excluded from the adjusted model, while variables with a *P* value lower than 0.25 were retained (model 2). The reliability of the measures was evaluated using Cronbach's coefficient alpha.

Results

The participants in the study had a mean age of 33.24 ± 7.65 years, with an age range of 15–49 years. The majority of the participants (77.1%) were housewives. In terms of education, 25.9% had primary education, 31% had completed secondary school, 19% had a diploma, and 24.1% had a university education. A large majority of the women (81.8%) had health insurance. Around 18.7% reported a history of smoking. Most participants (76.2%) stated that they could easily access medicine without a doctor's prescription, and 81% reported keeping medicine at home without a doctor's prescription. Table 2 presents more detail on background variables.

Table 3 summarizes the data on the prevalence of self-medication. The majority of OTC medicines used for self-medication were analgesics, accounting for 66.4%. Additionally, 43.2% of the participants resorted to antibiotics for self-medication. The findings revealed

Table 2. Background Variables Among Participants

Variables	Number	Percent
Occupation		
Employed	77	22.9
Housewife	259	77.1
Education level		
Primary school	87	25.9
Secondary school	104	31
Diploma	64	19
University	81	24.1
Economic status		
Weak	99	29.5
Medium	162	48.2
Good	75	22.3
Health insurance		
Yes	275	81.8
No	61	18.2
Smoking		
Yes	63	18.7
No	273	81.3
Access to medicine without a doctor's prescription		
Yes	256	76.2
No	80	23.8
Storage of medicine at home without a doctor's prescription		
Yes	272	81
No	64	19

Table 3. The Status of Self-medication in Different Medicines Among the Participants

Medicines	Yes n (%)	No n (%)
Over-the-counter medication		
Analgesics	223 (66.4)	113 (33.6)
Vitamins	211 (62.8)	125 (37.2)
Acetaminophen	193 (57.4)	143 (42.6)
Iron supplement	175 (52.1)	161 (47.9)
Cold tablets	149 (44.3)	187 (55.7)
Herbal medicines	148 (44)	188 (56)
Cough syrup	143 (42.6)	193 (57.4)
Antihistamines	129 (38.4)	207 (61.6)
Anti-nausea drugs	113 (33.6)	223 (66.4)
Prescription-only medication		
Antibiotics	145 (43.2)	191 (56.8)
Sleeping pills	89 (26.5)	247 (73.5)
Antihypertensive drug	75 (22.3)	261 (77.7)

that 199 individuals (59.2%) consumed at least one POM medicine for self-medication. Furthermore, all women (100%) reported a history of self-medication with at least one OTC medicine.

Table 4 presents the correlation, means, and SDs of HBM determinants. Based on the findings, there was a correlation between performing SMPB and all the HBM determinants, and the highest correlation was observed with the cues to action. Moreover, all determinants were significantly correlated with each other at a level of 1%.

The predictors of SMPB are listed in Table 5. The results indicated that age (beta = 0.109 and $P = 0.040$), susceptibility (beta = 0.179 and $P = 0.019$), and cues to action (beta = 0.440 and $P < 0.001$) were all found to be predictors of SMPB. Furthermore, the variables of the HBM were responsible for 47% of the variation observed in the outcome measure of the SMPB.

Discussion

Our findings revealed that 59.2% of women used POM medicines, and all of them had also consumed OTC medicines in the past three months. The most commonly used OTC medicines for self-medication were analgesics, accounting for 66.4% of usage. Additionally, 43.2% of the participants reported using antibiotics for self-medication. The results of a study conducted by Shokrzadeh et al among Iranian women of reproductive age demonstrated that the prevalence of self-medication was 68.9% (6). A study in Brazil reported that 50% of pregnant women used 1–4 OTC medications (24). The findings of another study performed in France revealed that 72% of pregnant women and 48% of non-pregnant women engage in self-medication (25). A recent study conducted in France has shown that 59% of pregnant women have resorted to self-medication at least once during their pregnancy (26). These statistics are close to our findings. Furthermore, our findings confirmed a higher prevalence of self-medication compared to other studies. The prevalence of self-medication varies across different countries. In Ethiopia, it has been reported as 26.6% (27), while in Mexico it

Table 4. Pearson Correlation, Mean, and SD of HBM Determinants

	X1	X2	X3	X4	X5	X6	Mean (SD)	Score Range
X1. Susceptibility	1						12.88 (4.72)	4-20
X2. Severity	0.664**	1					16.44 (5.72)	5-25
X3. Benefits	0.812**	0.683**	1				15.61 (5.80)	5-25
X4. Barrier	-0.748**	-0.830**	-0.815**	1			20.91 (8.75)	8-40
X5. Cues to action	0.661**	0.733**	0.675**	-0.757**	1		16.88 (5.41)	5-25
X6. Self-efficacy	0.656**	0.816**	0.664**	-0.737**	0.800**	1	13.40 (4.51)	4-20
X7. SMPB	0.538**	0.564**	0.504**	-0.564**	0.659**	0.584**	24.36 (5.89)	7-35

Note. SD: Standard deviation; HBM: Health belief model; SMPB: Self-medication prevention behavior.
**$P < 0.01$.

Table 5. Predictors of the SMPB

Variables	Model 1 (Crude)				Model 2 (Adjusted)			
	B	Std. Error	Beta	*P*	B	Std. Error	Beta	*P*
Age	0.149	0.042	0.191	0.001	0.085	0.041	0.109	0.040
Number of children	1.525	0.467	0.178	0.001	0.220	0.453	0.026	0.628
Occupation	0.018	0.773	0.001	0.982	-	-	-	-
Education status	0.155	0.292	0.029	0.597	-	-	-	-
Economic status	0.510	0.455	0.062	0.263	-	-	-	-
Insurance	-1.705	0.833	-0.113	0.041	-0.446	0.665	-0.029	0.503
Smoking	0.223	0.833	0.015	0.789	-	-	-	-
Easy access to medicine without a doctor's prescription	0.329	0.769	0.024	0.669	-	-	-	-
Storage of medicine at home without a doctor's prescription	-0.262	0.832	-0.018	0.753	-	-	-	-
Susceptibility	0.671	0.059	0.538	<0.001	0.224	0.095	0.179	0.019
Severity	0.581	0.048	0.564	<0.001	0.124	0.092	0.120	0.177
Benefits	0.512	0.049	0.504	<0.001	0.050	0.087	0.049	0.565
Barrier	-0.380	0.032	-0.564	<0.001	-0.014	0.064	-0.021	0.829
Cues to action	0.717	0.046	0.659	<0.001	0.481	0.085	0.440	<0.001
Self-efficacy	0.763	0.059	0.584	<0.001	0.086	0.112	0.066	0.442
Adjusted R square (model 2): 0.47, F: 31.353, $P < 0.001$								

Note. SMPB: Self-medication prevention behavior; Std. Error: Standard error.

has been 21.9% (28). A study in the Netherlands found that 12.5% of pregnant women practice self-medication (29). In Morocco, the rate among pregnant women was 32%, according to a study by Chergaoui et al (30). In Nigeria, Edet et al indicated a prevalence of 31% among pregnant women (5). Niriayo et al concluded that 40.8% of women in Ethiopia practice self-medication (31). Sah et al and Pereira et al observed a prevalence of 41.3% and 36% among pregnant women in Nepal (32) and Brazil (12), respectively. Overall, the estimated prevalence of self-medication worldwide is 32% (33). The alarmingly high rate of self-medication discovered in this study, in comparison to the global average, is concerning for health planners and policymakers in Iran. Our findings emphasize the significance of tackling self-medication among pregnant women in Iran and giving it particular attention.

The results of this study revealed that age plays a significant role in the adoption of SMPB among women of reproductive age in western Iran. As women get older, they are more likely to engage in SMPB. In line with the present finding, Edet et al, in their study on pregnant women in Nigeria, stated that self-medication was more common among people under 25 years old compared to people over 25 and 35 years old (5). However, Gbagbo and Nkrumah found no connection between age and the probability of pregnant women resorting to self-medication (34). The results of this study suggest that it is important to prioritize interventions for younger women in the western region of Iran.

In the present study, the results of the linear regression analysis revealed that susceptibility and cues to action were the most influential determinants for SMPB.

Our results demonstrated that the most significant factor in predicting SMPB was cues to action. This finding is valuable for creating educational programs for women in western Iran, highlighting the importance of emphasizing cues to action when designing interventions. One way to encourage changes in health behavior is to use personal experiences as cues to action. This implies that individuals can be motivated to make changes in their behavior when they have personal experiences related to a specific health behavior. Another strategy is to reach out to individuals when they encounter new health conditions. Accordingly, they can be provided with information and support to help them make necessary changes in their behavior (35). Health educators should prioritize identifying the key cues to actions that motivate individuals to avoid self-medication. Valuable insights can also be gained from the recommendations of doctors, pharmacists, healthcare professionals, and environmental advertisements in this area.

Perceived susceptibility was another crucial factor in predicting SMPB. Susceptibility refers to the level of certainty regarding the likelihood of encountering risks or acquiring a disease or infection (17,18). Although there are numerous risks associated with self-medication, many individuals fail to recognize their vulnerability to the potential side effects of OTC medicines (36). Many people will continue to use the medicines without a doctor's diagnosis, being unaware that the dangers may arise later in the advanced stages, leading to severe complications (20). According to the research performed by Pineles and Parente, when people prioritize pain relief over potential harm, they are more likely to use medication without a doctor's prescription (37). Health educators should take into account the misconceptions surrounding the advantages of self-medication when creating preventive interventions. Our research supports previous studies and highlights the importance of susceptibility in the promotion of SMPB. This is an important finding in the present study that should be taken into consideration by health educators. It seems that the development and implementation of programs to improve the perceived susceptibility toward the complications of self-medication in women of reproductive age can lead to useful findings in the prevention of self-medication.

In the present study, it is concerning to note that 18.7% of women of reproductive age had a history of smoking. This finding should be taken seriously by educators and health policymakers in Iran. It is worth mentioning that a study conducted by Chowdhury et al in Bangladesh reported a lower smoking rate of 9.6% among women of reproductive age (38), which highlights the difference between our study and theirs. Some studies have found that there is a significant number of women of reproductive age who smoke. For instance, Kennedy et al discovered that the rate of smoking among Aboriginal and Torres Strait Islander women in Queensland, Australia, was extremely high, reaching 62.9% (39). When it comes to the significance of this matter, it is important to note that there is a strong connection between maternal smoking and various negative outcomes during pregnancy. Smoking during pregnancy is a continuous risk factor for sudden and unexpected infants (40). Given that 18.7% of women in Iran smoke, it is recommended that future studies investigate the smoking status and related social cognitive determinants among women of reproductive age. If health policymakers in Iran do not address the issue of smoking among women of reproductive age, it will have serious health consequences and hinder the achievement of the sustainable development goal of reducing non-communicable diseases. Reproductive health programs in Iran should include prevention interventions and smoking cessation efforts. By identifying the determinants that influence smoking, theory- and evidence-based studies can develop targeted interventions.

Study Limitations

The primary limitation of this study was related to its environment and design. Considering that this study was conducted in a small city in western Iran, the findings may not be generalizable to women of reproductive age in other areas. In addition, this study only examined the historical smoking habits of women and failed to consider

their current smoking status. This is a limitation of our study. Additionally, the study's use of a cross-sectional design did not allow for the establishment of a cause-and-effect relationship. Furthermore, there is a possibility of recall bias.

Conclusion

Our findings revealed that a significant number of women in their reproductive years engage in self-medication. Determinants such as age, susceptibility, and cues to action were strong predictors of SMPB. The HBM can serve as a suitable framework for developing, implementing, and evaluating health education programs that promote SMPB while reducing self-medication prevalence among women of reproductive age. These findings have important implications for improving strategies to encourage responsible self-medication in this population. It is recommended that reproductive health programs focus on discouraging younger women from unnecessary and indiscriminate use of medication. It is also suggested that health promotion programs emphasize improving susceptibility to the possibility of suffering from self-medication complications, as well as increasing cues to action regarding the adoption of SMPB.

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Authors' Contribution

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Competing Interests

The authors declare that they have no conflicts of interest.

Ethical Approval

The study protocol (IR.KUMS.REC.1400.275) was approved by the research ethics committee of Kermanshah University of Medical Sciences. All procedures followed ethical standards set by the institutional and national research committee, as well as the 1964 Helsinki Declaration and its later amendments. Participants were fully informed about the study details, including how it would be conducted, the confidentiality of their information, and the purpose of the study before agreeing to participate. They were provided with a participant information statement and signed a consent form.

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References

1. Elghazaly A, Alsahali S, Farooqui M, Ibrahim N, Alshammari M, Almutairi A, et al. A cross-sectional study to investigate the prevalence of self-medication of non-opioid analgesics among medical students at Qassim University, Saudi Arabia. Patient Prefer Adherence. 2023;17:1371-9. doi: 10.2147/ppa.S407693.
2. Pons ED, Knauth DR, Vigo Á, Mengue SS. Predisposing factors to the practice of self-medication in Brazil: results from the National Survey on Access, Use and Promotion of Rational Use of Medicines (PNAUM). PLoS One. 2017;12(12):e0189098. doi: 10.1371/journal.pone.0189098.
3. Rangari GM, Bhaisare RG, Korukonda V, Chaitanya YL, Hanumanth N. Prevalence of self-medication in rural area of Andhra Pradesh. J Family Med Prim Care. 2020;9(6):2891-8. doi: 10.4103/jfmpc.jfmpc_204_20.
4. Urrunaga-Pastor D, Benites-Zapata VA, Mezones-Holguín E. Factors associated with self-medication in users of drugstores and pharmacies in Peru: an analysis of the National Survey on User Satisfaction of Health Services, ENSUSALUD 2015. F1000Res. 2019;8:23. doi: 10.12688/f1000research.17578.2.
5. Edet CK, Wegbom AI, Samuel KG, Sapira-Ordu L, Jaja ID, Ene-Peter J, et al. Prevalence and factors influencing self-medication among pregnant women attending antenatal clinics in urban tertiary hospitals in Nigeria. BioMed. 2023;3(1):166-76. doi: 10.3390/biomed3010014.
6. Shokrzadeh M, Jafari D, Hoseinpoor R, Jalilian J, Shayeste Y. Self-medication and its determinants in women of reproductive age in Gorgan city in 2018-2019. J Res Dev Nurs Midwifery. 2020;17(2):20-3. doi: 10.52547/jgbfnm.17.2.20.
7. Ailes EC, Dawson AL, Lind JN, Gilboa SM, Frey MT, Broussard CS, et al. Opioid prescription claims among women of reproductive age--United States, 2008-2012. MMWR Morb Mortal Wkly Rep. 2015;64(2):37-41.
8. Adane F, Seyoum G, Alamneh YM. Non-prescribed drug use and predictors among pregnant women in Ethiopia: systematic review and meta-analysis. J Matern Fetal Neonatal Med. 2022;35(22):4273-84. doi:10.1080/14767058.2020.1849105.
9. Atmadani RN, Nkoka O, Yunita SL, Chen YH. Self-medication and knowledge among pregnant women attending primary healthcare services in Malang, Indonesia: a cross-sectional study. BMC Pregnancy Childbirth. 2020;20(1):42. doi: 10.1186/s12884-020-2736-2.
10. Stanley AY, Durham CO, Sterrett JJ, Wallace JB. Safety of over-the-counter medications in pregnancy. MCN Am J Matern Child Nurs. 2019;44(4):196-205. doi: 10.1097/nmc.0000000000000537.
11. Tujuba TD, Chilo D, Abebe E, Zenu S. Self-medication and associated factors among pregnant women in rural Ethiopia: the importance of husband education in ensuring a safe pregnancy. Drug Healthc Patient Saf. 2023;15:39-50. doi: 10.2147/dhps.S394346.
12. Pereira G, Surita FG, Ferracini AC, de Souza Madeira C, Oliveira LS, Mazzola PG. Self-medication among pregnant women: prevalence and associated factors. Front Pharmacol. 2021;12:659503. doi: 10.3389/fphar.2021.659503.
13. Bartholomew LK, Mullen PD. Five roles for using theory and evidence in the design and testing of behavior change interventions. J Public Health Dent. 2011;71 Suppl 1:S20-33. doi: 10.1111/j.1752-7325.2011.00223.x.
14. Michie S, Prestwich A. Are interventions theory-based? Development of a theory coding scheme. Health Psychol.

2010;29(1):1-8. doi: 10.1037/a0016939.
15. Davis R, Campbell R, Hildon Z, Hobbs L, Michie S. Theories of behaviour and behaviour change across the social and behavioural sciences: a scoping review. Health Psychol Rev. 2015;9(3):323-44. doi: 10.1080/17437199.2014.941722.
16. Cummins KM. Explanations for the cloudy evidence that theory benefits health promotion. Front Psychol. 2022;13:910041. doi: 10.3389/fpsyg.2022.910041.
17. Janz NK, Becker MH. The Health Belief Model: a decade later. Health Educ Q. 1984;11(1):1-47. doi: 10.1177/109019818401100101.
18. Eldredge LK, Markham CM, Ruiter RA, Fernández ME, Kok G, Parcel GS. Planning Health Promotion Programs: An Intervention Mapping Approach. John Wiley & Sons; 2016.
19. Cobbold J, Morgan AK. An integrative review of the prevalence, patterns and predictors of self-medication in Ghana. Cogent Public Health. 2022;9(1):2098567. doi: 10.1080/27707571.2022.2098567.
20. Nguyen C, Do T, Dang T. Self-medication in Vietnam: why do consumers purchase medicines without prescriptions? Cogent Public Health. 2022;9(1):2136199. doi: 10.1080/27707571.2022.2136199.
21. Jalilian F, Hazavehei SM, Vahidinia AA, Jalilian M, Moghimbeigi A. Prevalence and related factors for choosing self-medication among pharmacies visitors based on health belief model in Hamadan province, west of Iran. J Res Health Sci. 2013;13(1):81-5.
22. Yin X, Mu K, Yang H, Wang J, Chen Z, Jiang N, et al. Prevalence of self-medication with antibiotics and its related factors among Chinese residents: a cross-sectional study. Antimicrob Resist Infect Control. 2021;10(1):89. doi: 10.1186/s13756-021-00954-3.
23. Polit DF, Beck CT, Owen SV. Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. Res Nurs Health. 2007;30(4):459-67. doi: 10.1002/nur.20199.
24. Araújo DD, Leal MM, Santos EJ, Leal LB. Consumption of medicines in high-risk pregnancy: evaluation of determinants related to the use of prescription drugs and self-medication. Braz J Pharm Sci. 2013;49(3):491-9. doi: 10.1590/s1984-82502013000300010.
25. Cabut S, Marie C, Vendittelli F, Sauvant-Rochat MP. Intended and actual use of self-medication and alternative products during pregnancy by French women. J Gynecol Obstet Hum Reprod. 2017;46(2):167-73. doi: 10.1016/j.jogoh.2016.10.005.
26. Lacroix I, Damase-Michel C, Lapeyre-Mestre M, Montastruc JL. Prescription of drugs during pregnancy in France. Lancet. 2000;356(9243):1735-6. doi: 10.1016/s0140-6736(00)03209-8.
27. Beyene KG, Beza SW. Self-medication practice and associated factors among pregnant women in Addis Ababa, Ethiopia. Trop Med Health. 2018;46:10. doi: 10.1186/s41182-018-0091-z.
28. Alonso-Castro AJ, Ruiz-Padilla AJ, Ruiz-Noa Y, Alba-Betancourt C, Domínguez F, Ibarra-Reynoso LD, et al. Self-medication practice in pregnant women from central Mexico. Saudi Pharm J. 2018;26(6):886-90. doi: 10.1016/j.jsps.2018.03.008.
29. Verstappen GM, Smolders EJ, Munster JM, Aarnoudse JG, Hak E. Prevalence and predictors of over-the-counter medication use among pregnant women: a cross-sectional study in the Netherlands. BMC Public Health. 2013;13:185. doi: 10.1186/1471-2458-13-185.
30. Chergaoui S, Changuiti O, Marfak A, Saad E, Hilali A, Youlyouz Marfak I. Modern drug self-medication and associated factors among pregnant women at Settat city, Morocco. Front Pharmacol. 2022;13:812060. doi: 10.3389/fphar.2022.812060 .
31. Niriayo YL, Mohammed K, Asgedom SW, Demoz GT, Wahdey S, Gidey K. Self-medication practice and contributing factors among pregnant women. PLoS One. 2021;16(5):e0251725. doi: 10.1371/journal.pone.0251725.
32. Sah AK, Giri A, Palikhey A, Chaurasiya RK, Yadav SK. Self-medication among pregnant women attending antenatal clinic at Tertiary Care Center of Nepal. Janaki Med Coll J Med Sci. 2020;8(2):5-10.
33. Mohseni M, Azami-Aghdash S, Gareh Sheyklo S, Moosavi A, Nakhaee M, Pournaghi-Azar F, et al. Prevalence and Reasons of Self-Medication in Pregnant Women: A Systematic Review and Meta-Analysis. Int J Community Based Nurs Midwifery. 2018;6(4):272-84.
34. Gbagbo FY, Nkrumah J. Implications of self-medication in pregnancy for Safe Motherhood and Sustainable Development Goal-3 in selected Ghanaian communities. Public Health Pract (Oxf). 2020;1:100017. doi: 10.1016/j.puhip.2020.100017.
35. Meillier LK, Lund AB, Kok G. Cues to action in the process of changing lifestyle. Patient Educ Couns. 1997;30(1):37-51. doi: 10.1016/s0738-3991(96)00957-3.
36. Green EC, Murphy EM, Gryboski K. The health belief model. In: The Wiley Encyclopedia of Health Psychology. John Wiley & Sons; 2020. p. 211-4.
37. Pineles LL, Parente R. Using the theory of planned behavior to predict self-medication with over-the-counter analgesics. J Health Psychol. 2013;18(12):1540-9. doi: 10.1177/1359105312465912.
38. Chowdhury SR, Islam MN, Sheekha TA, Kader SB, Hossain A. Prevalence and determinants of non-communicable diseases risk factors among reproductive-aged women: findings from a nationwide survey in Bangladesh. PLoS One. 2023;18(6):e0273128. doi: 10.1371/journal.pone.0273128.
39. Kennedy M, Barrett E, Heris C, Mersha A, Chamberlain C, Hussein P, et al. Smoking and quitting characteristics of Aboriginal and Torres Strait Islander women of reproductive age: findings from the which way? Study. Med J Aust. 2022;217(Suppl 2):S6-18. doi: 10.5694/mja2.51630.
40. Anderson TM, Lavista Ferres JM, Ren SY, Moon RY, Goldstein RD, Ramirez JM, et al. Maternal smoking before and during pregnancy and the risk of sudden unexpected infant death. Pediatrics. 2019;143(4):e20183325. doi: 10.1542/peds.2018-3325.