

Study To Assess Knowledge Regarding OTC Drug in Rural Areas

Snehal M. Gavit¹, Krutika J. Bhamre², Kashmira J. valvi³, Vaishali D. shewale⁴

¹*Student, Nandurbar Taluka Vidhayak Samiti Institute of Pharmacy, Khodai Mata Road, Near GTP College Campus Road, Tal & Dist.- Nandurbar (MS). India*

²*Department of Pharmaceutics, Nandurbar Taluka Vidhayak Samiti Institute of Pharmacy, Khodai Mata Road, Near GTP College Campus Road, Tal & Dist.- Nandurbar (MS). India*

³*Principal, Nandurbar Taluka Vidhayak Samiti Institute of Pharmacy, Khodai Mata Road, Near GTP College Campus Road, Tal & Dist.- Nandurbar (MS). India*

⁴*Department of Pharmaceutical Quality Assurance, Nandurbar Taluka Vidhayak Samiti Institute of Pharmacy, Khodai Mata Road, Near GTP College Campus Road, Tal & Dist.- Nandurbar (MS). India*

Abstract—Over-the-counter (OTC) drugs are widely used to manage minor ailments, particularly in rural areas where access to healthcare is limited. However, inadequate knowledge regarding their safe use can result in adverse outcomes. This study aimed to assess the knowledge and awareness of OTC drug use among rural populations. A quantitative pre-experimental one-group pretest–posttest design was adopted for 30 ASHA workers using a structured questionnaire. The results showed that the mean knowledge score increased from 3.7 (pre-test) to 10.7 (post-test), indicating a significant improvement following the educational intervention ($p < 0.05$). The study concluded that structured teaching programs are effective in enhancing awareness and promoting the safe use of OTC medications in rural communities. Data collection was facilitated with the support and assistance of Accredited Social Health Activist (ASHA) workers, who helped in community engagement and participant identification. Additionally, visits to local medical stores were undertaken to observe dispensing practices and gather supportive information related to OTC drug use. ASHA workers, who helped in identifying participants, building community report, and ensuring effective communication during the survey process. The involvement of ASHA workers can play a crucial role in spreading awareness and promoting the safe and rational use of OTC medications.

Index Terms—Over the counter drug [OTC] Drug, Rural areas, Pretest, Post test, ASHA workers

I. INTRODUCTION

Over-the-counter (OTC) medications are drugs that can be purchased without a prescription and are widely available in pharmacies [1][2]. They are intended for self-medication and are generally considered safe and effective when used appropriately [3]. Self-medication has become increasingly popular worldwide due to its convenience, cost-effectiveness, and easy access to health information through media and advertisements [4]. OTC drugs are commonly used to manage minor conditions such as colds, headaches, and allergies, and their use is influenced by consumer awareness and socioeconomic factors [5].

However, improper use of OTC medications can lead to adverse effects such as allergies, hypersensitivity, and drug resistance [6]. Issues like incorrect dosage, ignoring instructions, and using expired products further increase health risks [7]. Historically, drugs were sold without proper labeling or regulation, highlighting the importance of safe and informed use today [8].

Benefits of OTC drugs: [9] OTC drugs have benefitted that support society and healthcare teams in educating society towards self-awareness. The benefits of OTC drugs are as follows:

- They are effective in treating a large population suffering from minor illnesses at a low cost.
- They reduce the workload of the healthcare team in clinics and hospitals which enhances the time

period for the major illness of the patient. It also reduces the prescription for minor illness.

Side effects of OTC drugs ^[10]

- It increases drug resistance in patients and can also create complications in treatment.
- If OTC drugs are not effective than consult a doctor or physician over consumption of drugs can increase the cost to the patient.

Reasons for Side effects of OTC drug ^[9,11]

- Inappropriate treatment of disease and symptoms give rise to irrational use of drugs which lead to side effects and adverse drug reactions.
- Overuse and underuse of effective drugs result into catastrophic (sudden harm or serious damage) consequences.
- Use of multiple medications-poly pharmacy without knowing the cause of the illness

Classification of OTC Drugs
The commonly used over-the-counter medications include:

1. Pain relievers: Acetaminophen, Aspirin, Ibuprofen, Naproxen, Diclofenac.
2. Heart burn and Indigestion: Omeprazole, Lansoprazole, Rabepazole,
3. Laxatives: Bisacodyl and Calcium Docusate
4. Anti-diarrheal drugs: Bismuth sub-Salicylates and Loperamide.
5. Motion sickness: Dimenhydrinate.
6. Nasal steroids: Fluticasone and Triamcinolone
7. Cough Medicines: Dextromethorphan and Guaifenesin.
8. Antihistamines: Cetirizine, fexofenadine and Loratadine ^[12, 13]



Fig no 1 classification of OTC DRUG

Pain Relievers: These are agents used in treatment of pain, aches and fever. They are also called analgesics.

- Uses
 - Headaches.
 - Side effects
 - Liver damage.
 - Acute liver failure.
 - Allergic reactions in rare case ^[14,15]
- Heart Burn and Indigestion medicines:

These are the agents used in the treatment of heartburn and indigestion conditions. In heartburn the stomach acid or bile irritate the lining of breastbone area due to acid reflux. In digestion occurs in the upper GIT track and discomfort or pain in the stomach ^[16]

- Uses
 - Heartburn.
 - Regurgitation.

Side effects

- Headache.
- Rare but severe allergic reactions ^{[17],[18]}

- Aluminums Hydroxide: It is used as an antacid as well as a phosphate binder. It Neutralize the hydrochloric acid in stomach. It also binds with the phosphate present in the GIT track and Reduce the absorption of the phosphate in bloodstream.

- Uses
 - GERD (Gastro esophageal reflux Disease).
 - Peptic ulcers.
 - Phosphate binder.
- Side effects
 - Constipation.
 - Encephalopathy.
 - Skin rash or swelling ^{[19][20]}

- Laxatives: These are the agents used to treat out constipation and promote bowel movements. They soften out the stool and make it easier to pass ^[21]

- Uses
 - Constipation.
 - Bowel preparation before colonoscopy.
 - Relief from constipation by change in diet, travel, or medication.
- Side effects
 - Abdominal cramping.
 - Rectal irritation ^{[22],[23]}

- Anti-diarrheal: These are the agents used to treat out frequent, loose or watery stools caused by infections, GIT disorders, food and other medications.

Uses

- Acute diarrhea.
- Chronic diarrhea.
- Traveler diarrhea (Caused by infectious agents during travel).
- Side effects
 - Constipation.
 - Cardiac arrhythmias in overdose case^{[24],[25]}

- Role of Pharmacist in distribution of OTC medicines

Patients have easy and free access towards seeking advice from a pharmacist rather than a physician. The pharmacist solved out the patient issues or challenges like product selection, brand name confusion, appropriate information about the issue, recommend dosage of drug. The selection confusion is mainly due to marketing strategies of the manufacturers^[26]. OTC advertisements mislead the customer and give less information about the contradictions and safety concerns. The pharmacists provide information of the drug according to the state of patient and make sure the patient to safe use of medicine^{[27][28]}

Literature

According to the reviewed studies, the usage of over-the-counter (OTC) drugs is rising worldwide as a result of simple availability, economic expansion, and rising self-care awareness. OTC medications are convenient and lessen the strain on healthcare systems, but improper use particularly self-medication and the sale of over-the-counter antibiotics remains a serious issue. Numerous studies show that both urban and rural people have gaps in information, attitudes, and practices that might result in negative impacts and drug resistance. To encourage the safe and sensible use of over-the-counter drugs, educational initiatives, more stringent regulatory enforcement, and the active participation of medical professionals especially pharmacists are crucial.

Aim

To assess the knowledge and awareness regarding the use of over-the-drug [OTC] drug among the rural population

II. RESEARCH METHODOLOGY

A quantitative pre-experimental one-group pretest–posttest research design was adopted to assess the effectiveness of a structured teaching program on knowledge regarding over-the-counter (OTC) drug use among ASHA workers in rural areas

Table 1 Pre Experimental- One Group Pretest-Post Test Research Design

Sample	Pretest	Intervention	Post test
30	01	X	02
ASHA workers	Administration of structured knowledge questionnaire	Administration of structured teaching program	Administration of structured knowledge questionnaire

Representation of research design Keys

01 – Administration of structured knowledge questionnaire to assess existing knowledge regarding OTC drug

X – Interventions includes providing the structured teaching program to Women regarding OTC drug

02 – Administration of structured knowledge questionnaire to assess the post-test knowledge regarding OTC drug

- Setting Of the Study: -

The study was conducted in selected rural areas of Mograni village, Nandurbar district, Maharashtra, India. The pilot study was carried out in Navli village

- Sample: -

A total of 30 ASHA workers were included in the study. The sample size was determined based on feasibility, availability of participants, and similar previous studies conducted in rural settings.

- Sampling Technique:

A non-probability convenience sampling technique was used to select participants due to limited accessibility and availability of ASHA workers in the selected rural area.

- Sample Size: – The Sample Consists Of 30 Asha Workers

Sample Selection Criteria:

- Inclusion Criteria:

1. ASHA workers in rural areas who are willing to participate in the study.
2. ASHA workers who are able to understand the Marathi and English language.

- Exclusion Criteria:

1. The people who are not willing to participate in the study.
2. Absent during study period

- Study Variables

Independent Variable: Structured teaching program on OTC drug use

Dependent Variable: Knowledge score regarding OTC drug use

Demographic Variables: Age, educational qualification, and work experience

- Data collection tool

Data were collected using a structured questionnaire consisting of two sections:

Section A: demographic information [age, education]

Section B: Knowledge-related questions on OTC drugs the questions are asked regarding;

1. Do you know what 'OTC Medicines' are? (Medicines available without a doctor's prescription)
2. Do you think all medicines can have side effects?
3. Do you check the Expiry Date when buying medicine?
4. Is it safe to take OTC medicines during pregnancy or while breastfeeding?
5. Do you feel there is no need to visit a doctor for minor illnesses (e.g., cold, headache)?
6. Is it right to stop a course of OTC medicine halfway?
7. Do you suggest medicines to people you know on your own?
8. Which medicines have you taken without a doctor's advice in the last 6 months? (You can select more than one)
9. What is the main reason for taking medicine on your own?
10. What do you do if you experience any reaction or trouble after taking medicine?

- Validity and reliability

The tool was validated by experts in pharmacy and community health. A pilot study was conducted to assess feasibility. The reliability of the tool was ensured using appropriate statistical methods.

The reliability of the structured questionnaire was evaluated during the pilot study and demonstrated acceptable internal consistency, indicating that the tool was suitable for assessing knowledge regarding OTC drug use among ASHA workers.”

B) Scoring

- Structured knowledge questionnaire consists of 15 questions to assess knowledge among ASHA workers in rural areas about OTC drug
- Each question carries 1 mark.
- Question not attempted will have zero score.

Scoring Key: Table 2

SR no	Score	Result
1	0-3	Poor knowledge
2	4-6	Average knowledge
3	7-10	Good knowledge

III. PILOT STUDY

Pilot study was conducted to test the reliability, practicability, validity, and feasibility of the tool. The investigator obtained a written permission from the sarpanch of the village. The purpose of the study was explained to the participants prior to the study. Pilot study was conducted on 10 ASHA workers in rural areas and non-probability sampling technique descriptive cross sectional study sampling technique was used to select the sample. The investigator obtained the oral permission from the participants prior to the study. Pre experimental design (one group pretest-posttest design) used in this study. The result of the pilot study was analyzed by the descriptive and inferential statistics and it showed the study was feasible to do. So, the main study was proceeded

IV. METHOD OF DATA COLLECTION

1. Ethical permission obtained to conduct the study.
2. Serpent permission obtained from the investigator.
3. Obtained consent from each subject.

4. Descriptive cross sectional sampling technique was used to select the samples.
5. Pretest knowledge assessed among the selected samples by using semi structured interview schedule.
6. Provided structured teaching program regarding OTC drug among the ASHA workers in rural areas.
7. Then assessed posttest knowledge.
8. Pre experimental design (one group pretest-posttest design) was used.

Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee of Nandurbar Taluka Vidhayak

Samiti, Institute of Pharmacy, Nandurbar (Approval No: XXX). Written informed consent was obtained from all participants, and confidentiality of data was maintained throughout the study.

V. PLAN FOR DATA ANALYSIS

Data were analyzed using descriptive statistics (frequency, percentage, mean, Standard deviation) and inferential statistics (paired t-test). A p-value <0.05 was considered statistically significant.

Table 03 Represent the plan for data analysis

SR no	Data analysis	Method	Remark
1	Descriptive statistics	Percentage, Frequency distribution	To assess the demographic variables of ASHA workers in rural areas.
		mean, standard deviation	To assess the knowledge of OTC drug in rural areas
2	Inferential Statistics	Paired 't' test	To compare the pretest and posttest of ASHA workers regarding OTC drug



Fig.

VI. ANALYSIS

The analysis of the data collected was done with the help of descriptive and inferential statistics. The data was first coded and entered computer. Frequency, Percentage, Mean, Standard deviation, Split half method, paired-t test, were used to fulfill the objectives of the study.

Organization of the data

The collected data is tabulated, analyzed, organized and presented under the following heading.

Section I:

Description of Demographical characteristics of the samples. This section includes distribution of ASHA workers attending structure Teaching Program in relation to demographic data by using frequency and percentage.

Section II

Assessment of pre-existing knowledge scores of ASHA workers regarding OTC drug by using frequency and percentage of pre-test knowledge scores.

Assessment of post-test knowledge scores of ASHA workers regarding OTC drug by using frequency and percentage of post-test knowledge scores.

Section III

It deals with the analysis of data related to the effectiveness of structured teaching program on the knowledge scores by calculating difference between percentage of mean pre-test and post- test knowledge scores

Section IV:

Data analysis in relation to find out the association of pre-test knowledge score with selected demographic variables by using chi square test of association.

Section V:

Testing of Hypotheses by using paired "t" test

Hypothesis

H0: There is no significant association between the knowledge score and selected

Demographical variables of ASHA workers

H1: There is significant association between knowledge score with selected demographic variables of ASHA workers

Section: I

Table 4 Description of Demographic Characteristics of the Samples. Frequency and Percentages

SR	Characteristics	Category	Frequency	Percentage
1)	Age in year	18-25 year	12	24%
		26-35 year	18	36%
		36-40 year	10	20%
		Above 40 years	10	20%
2)	Qualification	Primary	23	73%
		Secondary	5	17%
		Higher secondary	1	3%
		Graduation	1	3%

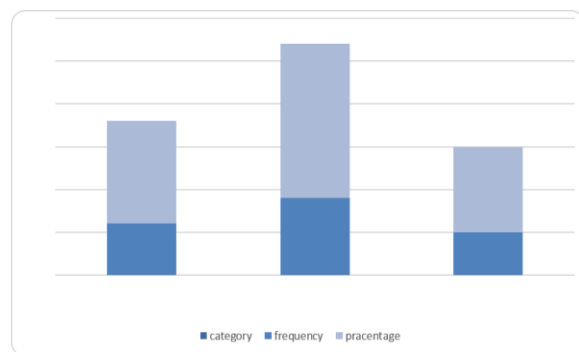


Fig no. 2 Percentage Distribution of people respondents according to age

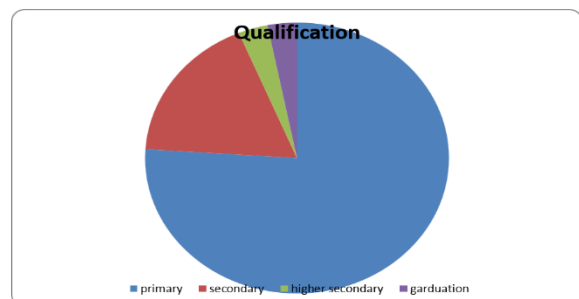


Fig no 3 Percentage distribution of people according to qualification

Section: II

Frequency and percentage distribution of knowledge score regarding OTC drug

Table 5: Frequency and Percentage Distribution of Pre-Test Knowledge Levels.

Knowledge level	Category	Frequency	Percentage
Good	8-15	2	7%
Average	5-7	8	27%
Poor	0-4	20	67%
	Total	30	100%

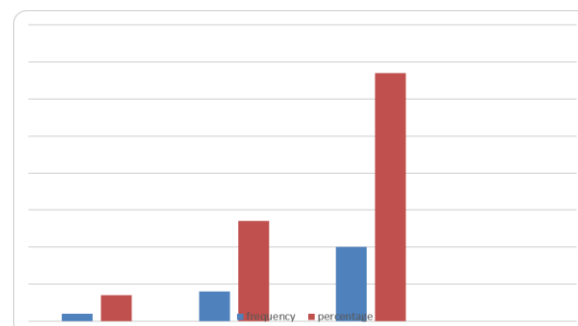


Fig no 4: Percentage distribution of people according to pre-test knowledge score.

Section: III

Table no 6: Frequency and percentage distribution of post-test knowledge levels. (n=30)

Knowledge level	Category	Frequency	Percentage
Good	12-15	14	47%
Average	10-11	10	43%
Poor	0-9	6	20%
	Total	30	100%

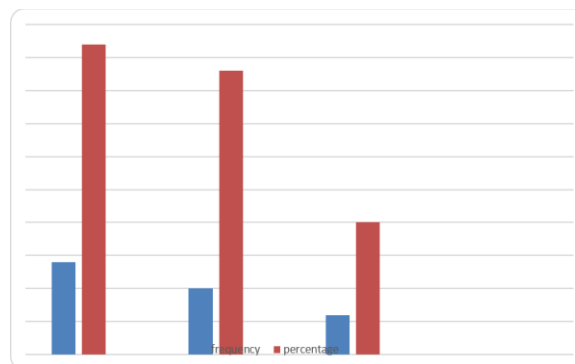


Fig no. 5 Percentage distribution of people according to post-test knowledge score.

Section: IV

Table 7: Comparison Between Pre-Test and Post-Test on Knowledge Score.

Knowledge	Mean	Std deviation	Mean difference	'T' value	P value	Significant
Pre- Test	3.7	2.72	7.0	11.47	0.0001	Significant
Post -Test	10.7	3.37				

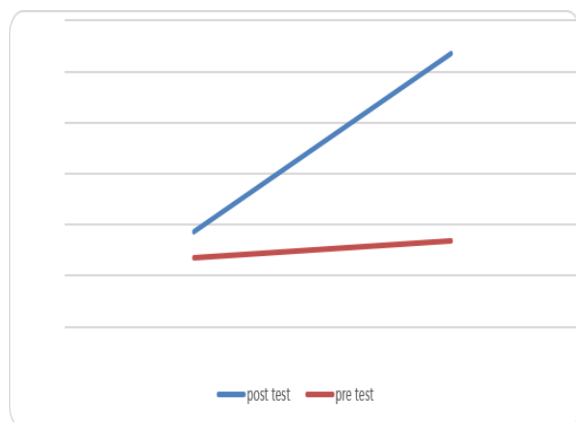


Fig no. 6 Comparison between Pre-Test and Post-Test of people according to knowledge score.

Section: V

Testing Of Hypothesis

H1: - There will be significant difference between pre-test and post-test level of knowledge regarding OTC drug in rural areas.

To find out significant difference between pre-test and post-test level of knowledge regarding OTC drug in rural areas paired 't' test was used. Section IV show that pre-test and post-test knowledge means were 3.73 and 11.26 respectively. The standard deviation for pre-test and post-test were 41.01 and 72.57 respectively. The mean difference was 7.53. The calculated 'T' value 14.47 is greater than table value (2.05) at degree of freedom 0.05 level. This indicates that structured teaching program was effective.

VII. CONCLUSION

The present study was conducted to assess the knowledge regarding over-the-counter (OTC) drugs among people in rural areas. Based on the findings of the study, it can be concluded that the overall knowledge of respondents regarding OTC drugs was moderate to inadequate. The analysis of pre-test data revealed that a majority of participants had poor to average knowledge about the proper use, dosage, side effects, and risks associated with OTC drugs. After the implementation of the structured teaching program, there was a significant improvement in the knowledge level of the participants, as evidenced by the post-test scores. The study also indicated that demographic factors such as education, age, and occupation had an influence on the level of knowledge. Participants with higher educational status demonstrated better understanding compared to others. Thus, the structured teaching program was found to be effective in improving awareness and knowledge regarding OTC drug use among rural populations. The findings highlight the need for continuous health education program to promote safe and rational use of OTC medications.

ACKNOWLEDGEMENTS

The authors would like to express their gratitude to Vaishali D. Shewale, the Principal of Nandurbar Taluka Vidhayak Samiti Institute of Pharmacy,

Nandurbar Dist. Nandurbar, for his essential suggestions and for providing the resources required to carry out this research study. The author is grateful to the faculty and staff of Nandurbar Taluka Vidhayak Samiti Institute of Pharmacy, Nandurbar, Dist. Nandurbar, for their encouragement and constructive criticism.

ABBREVIATION

Abbreviations	Full form
OTC	Over the counter drug
ASHA	Accredited Social Health Activist
API	Active pharmaceutical ingredients
DCC	Drug Consultative Committee of India
CESCO	Central Drug Standard Organization
FDCG	Food Drug and Cosmetic Act
LMICS	Low- and Middle-Income Countries
H0	Null Hypothesis
H1	Alternative hypothesis

REFERENCES

- [1] U.S. Food and Drug Administration, "Understanding over-the-counter medicines," Silver Spring, MD, USA. [Online]. Available: <https://www.fda.gov/drugs/buying-using-medicinesafely/understanding-over-counter-medicines>. [Accessed: May 1, 2026].
- [2] National Institute on Drug Abuse, "Over-the-counter medicines," Bethesda, MD, USA. [Online]. Available: <https://nida.nih.gov/publications/drugfacts/over-counter-medicines>. [Accessed: May 1, 2026].
- [3] Mohammed, "Self-medication: A serious threat to society," LOJ Nursing & Health Care, vol. 1, no. 1, 2018.
- [4] Shaghaghi, M. Asadi, and H. Allahverdipour, "Predictors of self-medication behavior: A systematic review," Iranian Journal of Public Health, vol. 43, no. 2, pp. 136–146, 2014.
- [5] S. Abdullah, L. L. Chaw, D. Koh, Z. Hussain, K. W. Goh, A. A. Abdul Hamid, et al., "Over-the-counter medicine attitudes and knowledge among university students in Brunei," International Journal of Environmental Research and Public Health, vol. 19, no. 5, p. 2658, 2022.
- [6] K. M. Bekele, A. M. Abay, K. A. Mengistu, B. W. Atsbeha, C. A. Demeke, W. S. Belay, et al., "Knowledge, attitude, and practice on OTC drugs among students," Integrated Pharmacy Research and Practice, vol. 9, pp. 135–146, 2020.
- [7] L. A. Nabors, H. D. Lehmkuhl, I. S. Parkins, and A. M. Drury, "Reading about over-the-counter medications," Issues in Comprehensive Pediatric Nursing, vol. 27, no. 4, pp. 297–305, 2004.
- [8] P. A. Marathe, S. K. Kamat, R. K. Tripathi, S. B. Raut, and N. P. Khatri, "Over-the-counter medicines: Global perspective and Indian scenario," Journal of Postgraduate Medicine, vol. 66, no. 1, pp. 28–34, 2020.
- [9] N. Sangeetha, B. S. Ruhi, S. S. Gowda, C. V. Shobhitha, Srividya, A. P. Ravinandan, and S. M. Ahmed, "Educational review on OTC drugs: A pharmacovigilance approach," International Journal of Pharmacy and Chemical Analysis, vol. 11, no. 4, pp. 295–302, 2024.
- [10] R. E. Ferner and K. Beard, "Over-the-counter medicines: Proceed with caution," BMJ, vol. 336, no. 7646, pp. 694–696, 2008.
- [11] U.S. Food and Drug Administration, "Prescription to nonprescription (Rx-to-OTC) switches," Silver Spring, MD, USA. [Online]. Available: <https://www.fda.gov/drugs/drug-application-process/nonprescription-drugs/prescription-nonprescription-rxotc-switches>. [Accessed: May 1, 2026].
- [12] S. Kartha, G. Kulyadi, K. Bhat, and M. Sathyanarayana, "Switching drugs from Rx to OTC status," Journal of Young Pharmacists, vol. 9, pp. 3–7, 2020.
- [13] American College of Gastroenterology, "Acetaminophen toxicity review," American Journal of Gastroenterology, vol. 114, no. 5, pp. 722–728, 2019.
- [14] World Health Organization, "WHO model list of essential medicines: Paracetamol," Geneva, Switzerland, 2020.
- [15] American College of Cardiology, "Aspirin for cardiovascular prevention," Journal of the

- American College of Cardiology, vol. 74, no. 9, pp. 1171–1181, 2019.
- [16] World Health Organization, “Aspirin for myocardial infarction,” Geneva, Switzerland, 2021.
- [17] National Institute of Diabetes and Digestive and Kidney Diseases, “Gastroesophageal reflux disease (GERD),” Bethesda, MD, USA, 2017.
- [18] F. L. Lanza, “GERD,” *American Journal of Gastroenterology*, vol. 93, no. 6, pp. 1057–1069, 1998.
- [19] G. Sachs, J. M. Shin, and C. W. Howden, “Clinical pharmacology of proton pump inhibitors,” *Alimentary Pharmacology & Therapeutics*, vol. 23, Suppl. 2, pp. 2–8, 2006.
- [20] G. R. Lichtenstein and S. Berman, “Phosphate binders in chronic kidney disease,” *Journal of Clinical Pharmacology*, vol. 41, no. 5, pp. 550–558, 2001.
- [21] M. Wilhelm and M. Dumesnil, “Antacids and acid-reducing agents,” *Therapeutic Advances in Gastroenterology*, vol. 6, no. 3, pp. 159–171, 2013.
- [22] M. So, and O. Fadiran, “Laxatives in constipation,” *Journal of Gastroenterology and Hepatology*, vol. 31, no. 6, pp. 1152–1160, 2016.
- [23] J. Svedlund and U. Stendahl, “Bisacodyl clinical use,” *European Journal of Gastroenterology & Hepatology*, vol. 19, no. 6, pp. 553–559, 2007.
- [24] L. Gerson and S. K. Fenton, “Constipation treatment,” *American Family Physician*, vol. 77, no. 2, pp. 211–218, 2008.
- [25] American Gastroenterological Association, “Loperamide in diarrhea,” 2019.
- [26] U.S. Food and Drug Administration, “Loperamide prescribing information,” Silver Spring, MD, USA, 2020.
- [27] National Institute on Drug Abuse, “Loperamide safety profile,” Bethesda, MD, USA, 2018.
- [28] S. S. Sansgiry and H. K. Patel, “Nonprescription drugs,” in *Encyclopedia of Pharmaceutical Science and Technology*, 4th ed., J. Swarbrick, Ed. Boca Raton, FL, USA: CRC Press, 2013, pp. 1–20.
- [29] E. P. Brass, “Changing drug status to OTC,” *New England Journal of Medicine*, vol. 345, no. 11, pp. 810–816, 2001.
- [30] M. Hughes, J. C. McElnay, and G. F. Fleming, “Benefits and risks of self-medication,” *Drug Safety*, vol. 24, no. 14, pp. 1027–1037, 2001.
- [31] M. Hughes, “Monitoring self-medication,” *Expert Opinion on Drug Safety*, vol. 2, no. 1, pp. 1–5, 2003.
- [32] R. J. Cooper, “Over-the-counter medicine abuse: A qualitative study,” *BMJ Open*, vol. 3, no. 6, p. e002913, 2013.
- [33] R. Paulose-Ram, R. Hirsch, C. Dillon, K. Losonczy, M. Cooper, and Y. Ostchega, “Analgesic use in U.S. adults,” *Pharmacoepidemiology and Drug Safety*, vol. 12, no. 4, pp. 315–326, 2003.