

The Expansion of Over-the-Counter Medication and Evolving Adolescent Perceptions

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With the recent expansion of over-the-counter (OTC) medication provided through prescription-to-OTC switches, many consumers within America are sharing various views on this expansion. Some consumers argue that the expansion of OTC medication will have benefits through accessibility and decreased cost, whereas some consumers argue that this will endanger society through drug abuse and the increased prevalence of it. Additionally, with the FDA's proposal of the Additional Condition for Nonprescribed Use (ACNU) plan potentially having the ability to expand OTC medication, the viewpoints on OTC have become polarized. This pilot study evaluates the extent of how OTC expansion affects perception in a localized high school, a demographic highly understudied through a non-randomized quasi-experimental survey design specifically in Frisco, Texas. Participants were anonymously recruited and assigned to two groups. Group A was given information about risks and benefits, whereas Group B was given the same information with additional knowledge regarding the expansion of OTC. The data was then compared and analyzed through the Mann-Whitney U test and a Spearman rank correlation coefficient test. The data, despite initial trust differences and an observed negative correlation, did not reach statistical significance after accounting for Bonferroni correction and t-distribution approximation. However, although there are various methodological limitations that affect the statistical result, this pilot study provides a preliminary insight into adolescent risk perception on nonprescription medication. Ultimately, this pilot sample suggests that exposure to general expansion may correlate to cautious trust responses, highlighting the need for a larger, validated study to see the true relationship between adolescents and over-the-counter medication.

Introduction

Over-the-counter medication, or OTC, has become popular within the recent decades. Alfarhan and other researchers of Jazan University and King Saud University in Saudi Arabia have argued that in Saudi Arabia, "81% of the general population has reported using OTC medications at some point in their lives"¹. Extending beyond Saudi Arabia, even in countries such as Spain, Sanchez and researchers affiliated with the university of Cadiz reported that the overall consumption of OTC drugs within the research was high at 78.9%². Even in recent years, over-the-counter medication has become popular, "with 19 out of 30 European countries permitting non-pharmacy sales"³, leading to around 40-60% of adults in the world using OTC⁴. This trend in OTC medication usage has been seen to be widespread globally, ultimately motivating regulation shifts into domestic pharmaceutical industries in the United States as well. Notably, the Food and Drug Administration (FDA) in America released the ACNU rule on December 23, 2024, otherwise known as the Additional Condition for Nonprescription Use. According to the FDA, the ACNU pathway allows for a drug product to be "marketed without a prescription if an applicant implements an additional condition to ensure ap-

propriate self-selection or appropriate actual use, or both, by consumers without the supervision of a practitioner licensed by law to administer such drug" to "increase options for applicants to develop and market safe and effective nonprescription drug products and increase consumer access to appropriate, safe, and effective drug products, which could improve public health"⁵. Although there has not been a medication with an ACNU, ACNU can theoretically expand consumer access to over-the-counter medication by allowing certain drugs that require a prescription to be marketed without a prescription if there is an additional condition to ensure appropriate usage. However, amongst various demographics, adolescents are often seen as the main demographic to abuse this OTC medication because of their limited knowledge on self-medication with OTC. Oftentimes, adolescents misuse OTC medication due to incorrect self-medication, leading to nearly 50% of all OTC-related emergency visits being related to adolescents⁶. Consequently, many researchers, such as Doomra and Goyal, researchers of Anav Rachna Dental College, have reported that "healthcare workers and doctors may find self-medication and its related harm a burden to the society"⁷, arguing that improper self-medication through use of OTC is dangerous to society. Many healthcare workers find that the practice of self-medication, which is only possible through nonprescription

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medication due to the refrainment of doctor's guidance, can create chances of misuse, such as drug abuse, overdose, and dangerous side effects, creating fear within consumers. With this fear of misuse being conflicted with the benefits of OTC, it creates divided views on the perception of OTC. Therefore, considering this polarization of perspectives in America and a heightened danger for adolescents, this pilot study conducted a survey in order to understand the general consensus and relationship between OTC expansion and adolescent perception.

Literature Review

This literature review aims to provide information on what other scholarly articles have explained, mainly regarding the benefits, risks, factors, and expansion of nonprescription medication within the United States. By recognizing these ideas and adding personal research, this research article focuses to explain the correlation between the overall expansion of a shift in adolescent perspective. Sources were found within online medical databases and were limited to peer-reviewed journals in order to maintain credibility. Keywords used during this research were: nonprescription drugs, OTCs, medication, consumers, pharmaceutical industry, and drug abuse.

Benefits of Nonprescription Drugs

To analyze the factors and their correlations of nonprescription drugs and expansion, the significance of the certain benefits and risks pertaining to OTCs is needed to contextualize the role nonprescription medication plays within American consumers. Researchers have concluded that through nonprescription drugs, common issues, such as delay, costs, and minor illnesses can be mitigated effectively. By relying on OTC medication, researcher Jouaneh, Terra Marie M. et al. (2025), affiliated to Johns Hopkins, argues that it can “decrease medical service costs”⁸. The decrease in service costs is mainly possible because “patients can also reduce the cost of their healthcare by avoiding physician fees before coming to the pharmacy”⁹. The alleviation of the economic burden caused by avoiding physicians serves as a way of promoting nonprescription and self-medication. At a lower price, more consumers, especially adolescents, who do not have financial freedom, are more inclined and able to obtain OTC, leading to self-medication, a form that even benefits physicians. To clarify, through self-medication, it allows for physicians to prioritize other tasks. Joshua Noone and Christopher M. Blanchette, researchers of Precision Health Economics, illustrates this idea, stating that “reducing the number of physician visits for conditions that can be self-managed has benefits that extend beyond these conditions, because more resources become available for the management of other potentially more serious or complex conditions”¹⁰. Through this,

physicians can also “address more significant health issues because they are not required to provide prescriptions for trivial diseases”¹¹. Jonghwa Chang et al., researchers affiliated with pharmaceuticals and public health, reinforces this idea by describing how self-medication allows doctors to “counsel more patients about the purposes and administration of different medications”⁹. Therefore, physicians have more bandwidth to treat patients who urgently require prescription medication, granting healthcare professionals increased prioritization on severe emergencies.

Additionally, OTC medications' widespread accessibility serves as a vital benefit for consumers that need medication in an emergency situation, demonstrated through a research paper published by JK Aronson (2004), a researcher related to the University Department of Clinical Pharmacology. Aronson elucidates that when someone gets an Asthma attack, consumers cannot anticipate it and get an inhaler beforehand due to its prescription-only criteria. In contrast, nose-drops and nonprescription medication that relieves other symptoms are readily available at any time¹². Collectively, these findings illustrate that OTC medication is able to reallocate limited resources toward needed patients, as well as reduce economic burdens for the patients themselves.

Risks of Nonprescription Drugs

However, prior research has also signified the many risks associated with over-the-counter drugs. To begin, Stone's research highlighted how more than 50% of 2.2 million adults, aged over 65, were under danger of OTC abuse¹³. For one, the risks of over-the-counter drugs are insufficiently exposed to patients and consumers. Hanna Ylä-Rautio et al., researchers affiliated to Finland Pharmacies, argue that based on previous reports, “41% of consumers believe that nonprescription medications are too weak to cause any problems”¹⁴. Almost half of American consumers perceive that nonprescription drugs are inherently safe. This statistic is seen in a 2004 study Wilcox et al., where the rates of use found in the study showed that 23 million Americans used NSAID, and “one-fourth of users exceeded the recommended dose of OTC medication, and the belief that OTC are safer than prescription doses was common”¹⁵. This insufficient knowledge is problematic for many consumers, as these medications have definite risks, and continued use can damage health rather than to improve it. AJS Pravin points out that many dermatological medications can cause “skin irritation (45%) and thinning of skin (30%)”¹⁶, with each percentage representing their likelihood of occurring, concluding the high commonality of skin problems due to OTC medication. This is further aggravated with popular NSAIDS products such as Advil or Motrin. Doomra and Goyal explained that “various studies have reported that NSAIDs may increase the risk of upper gastrointestinal com-

plications three to five times”⁷. With even frequently-used nonprescription medication having a chance at increasing dangerous side-effects, an unawareness of their implications is threatening to consumers’ health due to potential for ongoing usage. For adolescents, this fear of danger is heightened, as a diminishing parental control and increasing self-autonomy may lead to incorrect substance control, creating potential for drug abuse. Shehnaz et al. (2014) detail how “adolescents often perceive that they have complete knowledge about proper use of medicines, which has been contradicted in many studies”¹⁷. For instance, Ma and Zhang’s research in China (2025) highlighted that “97.5% of adolescents used OTC medications, [but] 23.75% lacked knowledge of proper usage, [and] 25.67% misunderstood antibiotic use”¹⁸.

Moreover, this hazardous pattern, a mix of superficial knowledge and harmful side effects, has been a trend for many types of OTCs, which is further worsened with medication with opioids, such as codeine. As explained by researchers of Nicolaus Copernicus University Łukasz Sobczak and Krzysztof Goryński (2020), codeine is often used with other medications to create cough suppression and analgesics. However, due to it being an opioid substance, people using codeine misuse it to create senses of “euphoria, relaxation, and feeling of warmth”- which can cause lethal side effects¹⁹. Mohammad Algarni et al. (2021), researchers affiliated with School of Pharmacy, Institute of Clinical Sciences, specifies these side effects of abusing codeine as “chronic headache, gastrointestinal haemorrhage, nephrotoxicity and hypokalaemia ... deteriorated family relationships, inability to continue employment, loss of children, spouses and family homes”²⁰. Even after patients try to withdraw from codeine, some of these patients tried to “harm themselves or commit suicide”²⁰. Ultimately, this increase in OTC expansion and its dangers have been prompting fear and uncertainty of whether OTC medication is safe or not.

The Expansion of Over-the-Counter Drugs

Despite these risks, OTC medication has expanded through prescription-to-OTC switches, while the FDA’s ACNU pathway also creates another potential pathway for additional medications to become available. In 2023, previous prescription-only medication, such as Opill or Narcan, has been made non-prescription through the FDA²¹. In addition to this, the ACNU pathway, created by the FDA in 2024, has created a new, potential pathway for a broader expansion of OTC medication.

According to Jouaneh, Terra Marie M. et al. (2025), the ACNU rule allows for the establishment of “additional requirements for a new pathway for certain drugs to be marketed as nonprescription products”, ranging variously from “self-selection questionnaire via a mobile application or pharmacy kiosk”⁸. This potentially expands OTC because through

this pathway, certain prescription-only medication can become non-prescription medication with an additional condition beyond labeling to ensure the consumer’s appropriate use. Although there has not been any OTC medication with ACNU, for the future, pairing these Rx-OTC switches with the new ACNU regulation could broaden the types of medications that may be considered for nonprescription use in the future, but the actual effect on OTC availability remains uncertain.

However, this expansion does not lead to the requirements for Rx-OTC switches being changed. According to Aronson, there are two important criteria for a drug to be an OTC. For a medication to become a non-prescription drug, “no matter how safe a drug is, lack of efficacy should militate against its use, (...) and if a medicine can cause a serious adverse effect it should not be made available over the counter”¹². Efficacy is crucial for an over-the-counter medication, as the consumption rate is extremely high. If there were to be a problem with its use, it would not only harm a multitude of patients but also worsen the views on over-the-counter drugs, as more consumers would perceive it as dangerous and useless. Fenichel, who is a researcher of the University of the District of Columbia, also reinforces this claim, claiming that “drugs that are safe but of only minimal efficacy may be denied over-the-counter status out of concern”¹¹. Without efficacy, there is no clear point of using OTC, as it will only waste the consumer’s time, effort, and money. Risks, as Aronson had pointed out, are also an important factor to consider. Aronson explains that “the antihistamines terfenadine and astemizole were withdrawn from over-the-counter sales when it was realized that they could cause ventricular arrhythmia”¹². Although many OTCs often have side effects, the level of the side effect matters, as nonprescription medication requires self-medication. If the OTC medication that was passed had high levels of side effects, the patient would not be able to self-regulate themselves, leading to severe outcomes for the consumer. Ultimately, Rx-to-OTC switches have contributed to the growth of nonprescription medication, whereas the ACNU pathway may provide new opportunities for future expansion without changing the requirements for regular Rx-to-OTC switches.

Summary

Although various sources regarding OTCs exist, they primarily are researched in a limited view. There is an insubstantial amount of research regarding nonprescription medication, expansion, and consumer trust tied together. Many studies have been conducted about risks, benefits, and most importantly, expansion, but its relationship on consumer perception has not been deeply analyzed. Additionally, most research is conducted with adults, creating a knowledge gap about how OTC affects adolescents in general, even though adolescents

are highly likely to suffer from incorrect OTC usage. Thus, there is a clear gap in research regarding adolescent perception and the facilitation of non-prescription drugs in America. Therefore, this research is aimed at identifying a correlation between the expansion of OTC and adolescent perception based on the knowledge of risks, benefits, and other factors that may influence teens between the ages of 14-17.

Methodology

This research aims to understand the relationships between OTC expansion and its implications with consumer perception. The main experiment method was a nonrandomized quasi-experimental survey design. This method was used to divide participants into two groups and compare their responses based on different information. The control group received information about the risks and benefits of OTC medication, whereas the experimental group received the same information with an additional statement describing increased OTC accessibility. This intervention serves as a priming technique to see how specific context can influence social perceptions. Through this observation, it becomes possible to identify the relationship and analyze its implications. Similar research by Hong Chen et al. in China, although not entirely quantitative, used a similar data acquiring process, with the main difference being the use of an interview instead of a survey. Through Chen's research method, Chen and other researchers were ultimately able to conclude the perception of consumers regarding pharmaceutical care²², signifying that this form of data collection has a high potential to work well. However, the data collection process, as argued before, was slightly different than Chen and her researchers.

Recruitment

To begin the research, a group of participants, ranging from the ages of 14-17 and of all genders, were gathered to perform this survey.

Ethical approval for this study was granted by the school campus Institutional Review Board of the Frisco Independent School District, approved on December 5th, 2025. As this research was conducted within a high school AP Capstone framework, there was no formal protocol, but the study was still reviewed formally under campus IRB rules. Participants were all from an AP Capstone class, and parental permission was obtained through their respective teachers. The adolescent consent form explicitly stated that "I have read and I understand the provided information... I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost." Participants had complete anonymity by assigning pseudonyms, containing all data confidentially, and all personal identifiers were

removed. However, because there were limitations on who could participate, the number of respondents were limited to 28 participants.

Group Design

Respondents were divided into two groups of participants: Group A and Group B, where both groups were given slightly different information regarding over-the-counter medication (See Appendix A). To specify, Group A represented the control group, where participants were given information regarding the risks and benefits of OTC, but not information regarding its expansion. Contrastingly, Group B, the experimental group, was given the information that Group A had, but with an addition of information regarding the expansion of OTC (See Appendix B). By giving the respondents supplemental information regarding expansion, comparing Group A and Group B can narrow down if the perception is influenced by the knowledge of the expansion of OTC based on any potential changes in survey results. However, because the experimental stimulus is a summary of general growth, the responses reflected reactions to this general framing, not to specific Rx-to-OTC switches.

Questionnaires

Furthermore, the survey itself had variations within the groups. Overall, both groups had 4 sections of survey questions: Perceived Necessity/Accessibility of OTC Medication, Perceived Safety of OTC Medication, Benefits and Risks of OTC Medication, and a concluding summary section. Additionally, both groups were answered through a 5-point Likert-type scale, ranging from strongly disagree to strongly agree. In the first section, most statements were about how OTC medication is necessary and easy to access with an exception of one reverse-coded statement that mentions the harm of nonprescription drugs (See Appendices B and C). In the second section of the survey, Perceived Safety of OTC Medication, statements mainly revolved around how OTC medication benefits safety, with one reverse-worded item about the dangers of misuse. To continue, the third section, the Benefits and Risks of OTC medication mainly mentioned about the benefits of OTC, with there being two reverse-coded items that mention the risks of OTC in order for a balanced survey. Finally, in the final section, for Group A, it asks generalized questions regarding OTC about each section, whereas Group B asks similar summarizing questions but includes the phrase "Since learning about the expansion of OTC" in order to make sure the participants recognize the factor of expansion. Group A and Group B, in Section 4, were counted as single-item questions despite reduced reliability in order to capture a holistic review of each topic. Additionally, within

this conclusion, group B has one reverse-coded item regarding trust (See Appendix B). These reverse-coded items throughout the entire survey were necessary, as Xijuan Zhang et al., researchers of the Department of Psychology, University of British Columbia, state, “RW [Reverse-Worded] items can control for acquiescence bias in the composite score of the scale”, while also acknowledging that “they cannot control for acquiescence bias in the factor structure of the scale”²³. RW items can prevent acquiescence bias, a bias where the respondent unconsciously gives the same answer for each question. This prevention is necessary in order to prevent distortion of data analysis, as the same response can shift the data incorrectly. However, due to small sample size preventing a formal scale validation, this study uses single-question analysis rather than composite scoring.

Data Collection

This entire process of data organization was a sequential allocation. Participants were redirected to either Group A or Group B’s survey based on the completion counts of each survey to ensure equal group size. After data was collected, questions 5, 13, 16, 21 of both groups and question 25 of Group B (see Appendix B) were subtracted from 6 in order to maintain direct consistency due to reverse-code. For instance, a participant originally scored 4 on question 5 regarding the negatives. However, because of reverse-code, it becomes a 2 in order to agree with the general questions in the section, which are all about positives. This subtraction is necessary for this Likert Scale to maintain consistency when comparing individual items. After finishing the data collection, the Mann-Whitney U test was used in order to analyze statistical significance between the groups of the individual items. This method was selected due to the data, which is a Likert Scale, was ordinal and therefore unable to fit with T-test, another commonly used method for analyzing surveys. After conducting Mann-Whitney U test, a Spearman Correlation Analysis was conducted in each groups’ data in order to figure out any potential correlations between subjects. After analysis, the resulting data from both Group A and Group B was collected digitally and visualized into tables in order for accurate and comprehensive data analysis of individual survey responses.

Results

The final sample size of this research was 28 participants, resulting in 14 per group. The individual questions are reported below.

The next table, Table 2, is a collection of Spearman Correlation Analysis of Group A and the comparisons of each section. This was done in order to reinforce potential relationships that

Table 1 Results

Questions	Group A Mean	Group A Median	Group B Mean	Group B Median
Q1	4.07	4.0	3.57	4.0
Q2	4.43	4.5	4.07	4.0
Q3	4.64	5.0	4.00	4.0
Q4	4.36	4.5	4.21	4.0
Q5	3.29	3.0	3.36	3.0
Q6	3.79	4.0	4.07	4.5
Q7	3.93	4.0	4.36	5.0
Q8	4.00	4.00	4.14	4.0
Q9	3.57	4.0	3.00	3.0
Q10	3.64	4.0	3.71	4.0
Q11	3.79	4.0	3.14	4.0
Q12	4.71	5.0	4.29	4.0
Q13	3.21	3.0	3.21	3.0
Q14	4.00	4.0	3.86	4.0
Q15	4.07	4.0	3.71	4.0
Q16	4.00	4.0	3.86	4.0
Q17	4.14	4.0	4.50	5.0
Q18	4.07	4.0	4.14	4.0
Q19	3.79	4.0	4.14	4.0
Q20	3.43	3.0	3.43	4.0
Q21	4.00	4.0	3.79	4.0
Q22	4.29	4.0	4.07	4.0
Q23A	3.86	4.0	N/A	N/A
Q23B	N/A	N/A	3.71	4.0
Q24A	4.00	4.0	N/A	N/A
Q24B	N/A	N/A	3.93	4.0
Q25A	4.29	4.0	N/A	N/A
Q25B	N/A	N/A	2.71	3.0

might arise between topics of Group A, not just relationships between Group A and B.

Discussion

Score Comparison

Within the collected data, there was not a major score difference between both groups across Sections 1-3, suggesting that the general perception of OTC medication is stable regardless of exposure to OTC expansion knowledge. Overall, throughout the survey responses, most individual question responses had a higher median value for Group A rather than Group B. The reported mean values of the individual questions were also usually higher for Group A, although there were more occurrences of Group B having a higher value than Group A compared to the median values.

Within section 4, it appeared to have a potential direction to a difference in trust scores between groups, with a p-value of

Table 2 Spearman Correlation Analysis of Group A/B

Sections	Spearman's ρ (Group A)	Spearman's ρ (Group B)
Section 1 (Necessity/Accessibility) and Section 2 (Trust/Safety)	0.11	0.57
Section 1 (Necessity/Accessibility) and Section 3 (Risks/Benefits)	0.25	0.49
Section 2 (Trust/Safety) and Section 3 (Risks/Benefits)	-0.31	0.32
Section 4 (Trust and Accessibility)	0.38	-0.42
Section 4 (Trust and Risks)	0.13	-0.04
Section 4 (Risks and Accessibility)	-0.27	0.48

0.03. However, after applying Bonferroni correction (0.05/6) for all comparisons, it results in 0.0083, which is smaller than the reported p-value. Therefore, statistical significance was not reached.

Relationship Between Topics

The relationship between topics was measured by the Spearman Rank Correlation Coefficient test. When using this test to analyze Group A, most values indicated a positive score, with Section 4 (Trust and Accessibility) having the highest positive correlation of 0.38 (See Table 2). Interestingly, however, when measuring the same topics for Group B, it resulted in a negative relationship of -0.42, the lowest value for Group B. However, when applying t-distribution approximation and with 12 degrees of freedom, the resulting p-value is 0.135, representing that the statistic could have been random at a 13.5% chance. Therefore, both Spearman Correlation coefficients are statistically insignificant.

Limitations

Although this research identifies the answers to the research question, there are clear limitations that hinder comprehensibility. For instance, Section 4 of the research is single-question items. Therefore, despite obtaining statistical significance for the Trust portion of section 4, the credibility is lowered because only one question was asked about the topic. Because it acts as a single question, it makes each response weigh much more, creating potential distortion of results. Another issue with the survey was the format of the trust questions and the stimulus. Group A responded to a general statement regarding trust, whereas Group B had a statement attributing lowered trust to learning about OTC expansion. The stimulus given was also a general framing of expansion. This therefore leads to a limitation of the interpretation on the observed difference, as there is not a clear, direct measurement

of trust between the groups, nor is there a clear reflection to FDA's regulatory proposal. The survey was also not purely random, as there was an allocating method used.

Therefore, this may have created a potential selection bias due to it not being a strictly random system. Furthermore, the sample size acts as a significant constraint in the limit. Most surveys consist of a minimum amount of 30, whereas this research only contains 28 participants, making this study a pilot study. According to Memon Ali and other researchers in India, they state that many researchers base their sample size on Roscoe's 1975 Guidelines, as he "suggested that a sample size greater than 30 and less than 500 is suitable for most behavioural studies (...) 30 respondents should be considered the minimum for each group"²⁴. Although Roscoe's guidelines suggest 30 respondents per group for accurate behavioral statistics, because this research survey has a total of 28 respondents, it signifies a clear deficiency in participant amount. Therefore, because there is a small sample size, this research does not accurately depict the entire population of adolescents. This inaccuracy is further exacerbated because participants of this research are located in the same area, not representing any geographical differences in rural, urban, or culturally different areas. Therefore, this research does not get the entire scope of adolescents in America, but rather a small portion of the population. Additionally, within the methodology and the intervention, the internal validity is lowered because in Group B, there was no assurance that Group B participants read the information about the expansion of OTC. Therefore, this may have affected the impact of the data, as Group B may not have fully undergone the intervention, potentially diluting the comparison between groups. Also, group B's information about OTC information was described broadly and mentioned expanding in multiple parts of the world, without giving specific examples. Therefore, there was not a clear definition of OTC expansion, leading to participants potentially having different ideas of OTC expansion. The differences, therefore, between Group A and B, can instead reflect participants' responses to

the general framing of OTC expansion of the stimulus, rather than an accurate representation of its true expansion through Rx-to-OTC switches.

Implications

The findings of this pilot study may lead to implications primarily for pharmaceutical companies. One of the main implications that arise is the need to highlight the safety precautions of Rx-OTC switches. Despite no statistically significant data in this research, larger studies should investigate whether the trend toward a decreased level of trust exists. If this level of diminished trust were to exist, pharmaceutical companies need to create ways or highlight their preexisting regulations they undergo when creating OTC medication. As stated by Aronson, “no matter how safe a drug is, lack of efficacy should militate against its use, (...) and if a medicine can cause a serious adverse effect it should not be made available over the counter”¹². However, companies are not highlighting these factors that go in place when creating Rx-OTC switches or OTC medication, which is the main stem of expansion. One possible suggestion, as stated by Sapkal et al. (2025), is to expand online advertisement of OTC medication, as “consumers today frequently look up items and self-care solutions online before making a purchase [because] they may be bought without a doctor’s prescription”²⁵. Another implication through this research is the need to teach better drug literacy within adolescents. Participants in the study appeared to have not fully understood the power of over-the-counter medication. When looking at both Group A and B, both groups showed a moderately high score to Risks/Benefits, meaning that on average, most participants view OTC medication as safe. This strong perception of safety is dangerous for adolescents, as this may reflect that adolescents are not truly understanding how dangerous OTC medication can be. Therefore, adolescents should also be taught more on OTC risks, as their perception of risks did not change significantly despite OTC expansion intervention. Consequently, educational programs targeting this perception of risk can also make sure adolescents do not fall into OTC abuse, hopefully reducing the statistics of 50% of all OTC-related emergency visits being related to adolescents⁶.

Suggestions for Future Research

For future research building upon this pilot study, the limitations must be addressed. There is a need to maintain survey validity through the same construct of questions, and to ensure that the information given to participants beforehand is clearly about OTC expansion, not just general information regarding how it became more available. Additionally, researchers

should create a separate test to measure how effective respondents learned about OTC expansion and then expose them to the survey questions in order to maximize the intervention effect. Additionally, the survey should be expanded to a larger demographic that goes beyond a suburban level, as to encompass the true American population for the youth, it is necessary to address the youth living in rural urban, and suburban areas to get all perspectives.

Conclusion

This research paper addressed the lack of adolescent-based research on OTC expansion by analyzing the relationship between OTC perception and its factors such as risks, benefits, and expansion. Although there was no statistical evidence, the directional shift in mean trust scores highlight the need to explore consumer uncertainty in future as larger-scale research.

Additionally, this research raises the concern of the need to raise transparency and awareness from pharmaceutical, regulatory bodies to diminish drug mistrust, as well as to prevent OTC misuse amongst adolescents.

Above all, this research should raise the utmost importance and highlight the fact that nonprescription medication should exist to serve the health of the youth, never to cause fear and harm to the youth population.

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Appendix A

Control Group Information

OTC medication, otherwise known as over-the-counter or nonprescription medication, are types of medication that can be obtained without a prescription from the doctor. Many research studies have concluded that this type of medication can be effective in terms of cost, its helpfulness against minor illnesses, and its efficiency. However, research studies have also concluded that OTC medication presents risks as well, such as the potential for drug abuse due to incorrect usage or medication containing opioids. Nonprescription medication additionally has potential for side effects that may harm a user's health, such as skin irritation, drowsiness, or more, creating danger for patients.

Experimental Group Information

OTC medication, otherwise known as over-the-counter or nonprescription medication, are types of medication that can be obtained without a prescription from the doctor. Many research studies have concluded that this type of medication can be effective in terms of cost, its helpfulness against minor illnesses, and its efficiency. However, research studies have also concluded that OTC medication presents risks as well, such as the potential for drug abuse due to incorrect usage or medication containing opioids. Nonprescription medication additionally has

potential for side effects that may harm a user's health, such as skin irritation, drowsiness, or more, creating danger for patients. Most importantly, with this information at hand, it has also been noted that OTC medication has been seen to increase in terms of its accessibility, expanding its research in multiple parts of the world. With this overall expansion, various debates have arisen regarding the true benefits and risks of OTC, and which implication truly outweighs the other.

Appendix B

SURVEY QUESTIONS

First Section: Perceived Necessity/Accessibility of OTC Medication

- OTC medication is necessary for the health of a patient.
- OTC medication is easy to access.
- I am able to go into local pharmacies nearby and get OTC medication with ease.
- OTC medication improves convenience for patients.
- Nonprescription drugs can harm society.
- I rely more on nonprescription drugs for minor health problems than consulting a doctor.
- OTC medication is a cost-effective alternative compared to prescription drugs.
- OTC medication allows patients to have more independence in order to maintain their health.

Second Section: Perceived Safety of OTC Medication

- Prior to this research survey, I have known about the dangers of OTC Medication.
- I believe that OTC medication is safe to use.
- The FDA, Food & Drug Administration, has placed multiple regulations on OTC medication.
- Some OTC medication should have safety precautions on its use.
- I am worried that OTC medication can have potential harmful side effects.

- I trust the OTCs located in my nearby pharmacy.
- I am confident in my use of nonprescription drugs without healthcare professionals' guidance.

Third Section: Benefits and Risks of OTC Medication

- OTC Medication provides more benefits than risks to consumers as a whole.
- OTC can harm society if misused.
- OTC medication improves accessibility for various consumers.
- The presence of OTC medication lessens economic costs for medication.
- OTC can reduce the workload of medical professionals.
- OTC medication can lead to addiction or abuse
- OTC Medication works well for low-income families or individuals.

Control Group Only Question (Section 4):

- I trust OTC medications.
- OTC medication increases the risks of misuse.
- OTC medication has improved healthcare accessibility for the public.

Research Group Only Question (Section 4):

- Since learning about the expansion of OTC, I believe it has improved healthcare accessibility to OTC medication for the public.
- Since learning about the expansion of OTC, I believe it has increased the risks of misuse.
- Since learning about the expansion of OTC, I believe it has lowered my trust for OTC medication.