



Factor Determining Consumers' Decisions to Purchase Topical Analgesic for Musculoskeletal Disorders in Indonesia

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ABSTRACT

Background: Various choices of topical analgesic to treat musculoskeletal disorders are available on the market

Objectives: This study aims to determine the influence of psychological, cultural, social, and personal factors on purchasing decisions for topical analgesic drugs among consumers who need medication for musculoskeletal disorders

Methods: This is cross-sectional quantitative research with an inferential statistics analysis approach. A convenience sampling technique was used to collect data during January 2023 using a questionnaire that was distributed online with a Likert scale via Google Form. A total of 318 respondents from 30 provinces in Indonesia who purchased topical analgesic drugs with complaints of musculoskeletal disorders and aged 18-60 years participated in this study. The data was analyzed using multiple linear regression to determine the relationship of psychological, cultural, social, and personal factors associated with purchasing decisions

Results: The study showed that the majority of respondents were male (50.6%), domiciled in Central Java (20.1%), aged 21-25 years (29.9%), worked as private employees (37.1%) with a working duration of 6-8 hours (59.4%), and had an income of IDR 2,500,000-3,499,000/month (40.6%). The product most frequently purchased was the cream dosage form (60.1%), with locations in pharmacies (74.5%). The results of partial and simultaneous hypothesis testing show that psychological, cultural, social, and personal factors have a significant positive influence ($p < 0.05$) on the decision to purchase topical analgesic drugs among consumers who need medication for musculoskeletal disorders

Conclusion: Given that psychological, cultural, social and personal factors influence decisions, it is recommended that marketers understand these factors.

Keywords: musculoskeletal disorders; purchase decision; topical analgesics

INTRODUCTION

Musculoskeletal pain is a challenging condition for patients and physicians. Many people have experienced one or more episodes of musculoskeletal pain at some time in their lives, regardless of age, gender, or economic status.¹ The largest prevalence of musculoskeletal disorders in Indonesia is Central Java which reaches 18.9%.² Musculoskeletal pain is acute or chronic pain affecting bones, muscles, ligaments, tendons, and even nerves, and pain associated with musculoskeletal disorders.³ The most common musculoskeletal disorder in adults is low back pain (30-40%); followed by neck and shoulder pain (15-20%); knee pain (10-15%), and fibromyalgia and rheumatoid arthritis around 2%.¹ Analgesic drugs are the most common choice for treatment to relieve pain due to musculoskeletal disorders.

One dosage form that is easy to use and easy for consumers to obtain is a topical analgesic. Topical analgesic drugs from the Nonsteroidal Anti-Inflammatory (NSAID) group can effectively reduce musculoskeletal pain and can be given to consumers who experience chronic pain. The use of topical analgesics

is popular, especially among consumers who complain of pain.⁴ Topical dermatology products are dosage forms that are easy to administer and easy to use in treating various diseases and are available in various dosage forms such as ointments, gels, creams, lotions, solutions, suspensions, etc.⁵ Satisfaction with topical medication appears to be a major determinant of adherence⁶ as it relates to consumers' acceptability. Furthermore, Shariff⁷ stated that developing appropriate drug designs requires a holistic and patient-centric approach to improve acceptance and compliance. One of the challenges facing pharmaceutical companies is patient acceptance and continued use of their products. Therefore, drug product development must begin with a clear understanding of patient needs and provide solutions that meet these needs. There is still limited research examining consumer decisions to purchase topical dosage forms. Various existing studies tend to relate to consumer preferences regarding routes of administration and drug formulations^{8;9;10;11;12} or drug purchasing decisions,^{13;14;15} which are not specific to certain dosage forms.

Purchasing decisions can be influenced by a series of psychological processes and consumer characteristics, which are strongly influenced by psychological, cultural, social and personal factors.¹⁶ Therefore, to find out the factors that can influence someone in deciding to buy a product, it is necessary to understand consumers' behavior. With the variety of analgesic products¹⁷ as well as the increasing use of topical analgesics in Indonesian society, business actors need to be able to understand consumer behavior in making decisions to purchase topical analgesic products that are currently available on the market. There is still little research regarding consumer behavior in selecting, purchasing, and using topical analgesics. Therefore, this research was conducted to determine the psychological, cultural, social, and personal factors that influence consumer decisions in purchasing topical analgesic products for musculoskeletal disorders.

METHODS

Study design

The current study is an observational study with a cross-sectional approach which aims to determine and study the relationship between dependent and independent variables.

Population and samples

Purposive samples were selected conveniently based on the inclusion criteria including Indonesian citizens who currently reside in Indonesia; aged 18-60 years; and have purchased topical analgesics for musculoskeletal disorders in the last 3 months was used to collect the samples. The exclusion criteria were consumers of national health insurance, so that respondents' decisions in choosing drugs were not limited by the drugs provided by the insurance company. Incomplete data were not included in the analysis. Due to the exact number and size of the population were not known (prevalence of people with musculoskeletal disorders and using topical analgesic drugs during the last 3 months), the sample size was calculated using the Cochran formula, and the minimum sample size was 97.

Study instruments

A questionnaire was developed after a preliminary review of the literature. A comprehensive literature review on predictors of consumers' decisions and behavior^{18,19,20,21} was conducted before questions were generated and discussed with experts. There was one invalid question deleted/not used with the consideration that the information obtained in this question can still be represented by other questions from the same domain. The validation test results showed that of the 30 questions, 29 of them were valid with a correlation value greater than 0.05 and showed a calculated r value $>0.4-0.8$ compared to the r table. The results of the reliability test show that all research variables provide Cronbach's Alpha > 0.675 so they are reliable.

The instrument used for data collection was a structured questionnaire with close-ended questions. The first section collected the demographic information of the participants in multiple choices. The second section contained questions regarding the topical analgesic purchase history in multiple choices. The third section concerned the factor determining consumers' decision.

Data collection

The participants were asked to answer close-ended questions regarding their tendency to make purchases topical analgesic for musculoskeletal disorders, on a five-level Likert-type scale ("score 1 for Totally Disagree" to "score 5 for Totally Agree"), their agreement with statements regarding the degree of certain factors (psychological, cultural, social and personal) affect their topical analgesic purchasing decisions. The questionnaire

in Google Form was distributed online through social media such as WhatsApp, Facebook and Instagram to all Indonesian who met the inclusion criteria during data collection (1-31 January 2023).

Data Analysis

Univariate analysis was carried out to determine the distribution of sociodemographic characteristics (gender, domicile, age, highest level of education, occupation, estimated duration of work in a day, and income) and history of purchasing topical analgesic drugs for musculoskeletal disorders. Multiple linear regression model was used to examine the association between the independent variables on the dependent variable. Psychological, cultural, social, and personal factors were used as independent variables, while purchasing decision was used as dependent variable. An alpha value of $p < 0.05$ was considered significant.

RESULTS AND DISCUSSION

A total of 318 respondents spread across various regions of Indonesia who met the inclusion criteria participated in this study. Table I shows data on sociodemographic characteristics resulting from the data collection via online questionnaires using various social media platforms.

The study showed that 161 (50.6%) males and 157 (49.4%) females participated in this research. Most of the respondents involved in this study live in Central Java, 64 (20.1%) respondents, followed by the D.I. Yogyakarta with 45 (14.2%) respondents and East Java with 36 (11.3%) respondents. The highest age group of respondents who participated in this research was 21-25 years old, 95 (29.9%) respondents, and the age group of 26-30 years 89 (28%) respondents. High School (SMA) graduates or equivalent were the largest number of respondents, 46.5% of those involved in this study. The majority of types of work were private employees 118 (37.1%), while the longest 189 (59.4%) work duration per day was 6-8 hours. The majority of respondents 126 (40.6%) had an income of IDR 2,500,000-3,499,000/month.

The results of the history of purchasing topical analgesic drugs can be seen in Table II. This data provides an overview of the location and when the drug was last purchased, as well as the dosage form of the drug chosen. The majority of 111 (34.9%) respondents purchased within 1 month, which was calculated from the time they filled out the questionnaire. The most frequently purchased dosage form was cream with 190 (59.7%) respondents, followed by the patch dosage form with 164 (51.6%) respondents. In addition, respondents who had a history of purchasing gel dosage forms were 135 (42.5%) respondents and sprays were 103 (32.4%) respondents. The most popular places to purchase topical analgesics were pharmacies with 236 (74.2%) respondents and supermarkets with 148 (46.5%) respondents.

The current study shows that respondents generally preferred the topical cream form, compared to delivering drugs through the skin with other dosage forms. This is likely due to the cream dosage form for topical pain relievers being the most widely available on the market, as well as topical dosage forms being cheaper compared to transdermal, patch, spray, or other forms. There are various ways of delivering drugs through the skin, including three important ways such as topical, regional, and transdermal.²² Semi-solid dosage forms of drugs can be topical or transdermal. Topical semi-solid dosage forms are applied to the surface of the skin and remain there. Topical dosage forms are preferred over other dosage forms because they provide local therapeutic activity when applied on the skin or mucous membranes.²² Topical forms are typically used to treat dermatological conditions such as acne vulgaris, infections, wounds to the skin, and eczema, while transdermal dosages are typically used to treat conditions that require ongoing medication, such as pain management.²³ Topical dosage forms could be classified into three major categories such as solid (dusting powder), liquid (lotion, liniment), and semi-liquid (ointment, paste, cream, and gel). The most common topical vehicles include ointments, creams, gels, and lotions, among others.²³ The current study shows that most topically applied dosage forms were semi-solid. Since the property of semisolids can stick to the application surface for a long time helps prolong drug delivery application site.²³ The definitions of lotions, gels, creams, and ointments vary depending on literature source, market history, or traditional use.²⁴ Cream is a semisolid emulsion formulation for application to the skin or mucous membranes. Creams are homogeneous, semi-solid preparations consisting of opaque emulsion systems.²⁵ Creams have several advantages like easy to apply, and more effective compared to other avoiding risks. The function of skin creams is to protect the skin against harshness from the environment and any dry conditions of the skin. The cream chosen in this study can be interpreted as a dosage form of all types of semi-solid dosage forms such as ointment or unguent, this is because the terms cream, unguent, or

Table I. Sociodemographic characteristics of respondents (n: 318)

Category	Total (N)	Percentage (%)
Gender		
Male	161	50.6
Female	157	49.4
Domicile region		
N. Aceh Darussalam	1	0.3
North Sumatera	1	0.3
South Sumatera	4	1.3
West Sumatera	3	0.9
Bengkulu	3	0.9
Riau	6	1.9
Kepulauan Riau	3	0.9
Jambi	9	2.8
Lampung	12	3.8
Bangka Belitung	4	1.3
West Kalimantan	5	1.6
East Kalimantan	4	1.3
South Kalimantan	7	2.2
Central Kalimantan	2	0.6
North Kalimantan	4	1.3
Banten	15	4.7
Jakarta	27	8.5
West Java	31	9.7
Central Java	64	20.1
Yogyakarta	45	14.2
East Java	36	11.3
Bali	5	1.6
East Nusa Tenggara	4	1.3
West Nusa Tenggara	3	0.9
Gorontalo	7	2.2
West Sulawesi	2	0.6
Central Sulawesi	4	1.3
North Sulawesi	2	0.6
Maluku	4	1.3
North Maluku	1	0.3
Age (years)		
18-20	26	8.2
21-25	95	29.9
26-30	89	28.0
31-35	45	14.2
36-40	36	11.3
41-45	14	4.4
46-50	4	1.3
51-55	8	2.5
56-60	1	0.3
Level of education		
Elementary school	1	0.3
Junior high school	6	1.9
High school	148	46.5
Bachelor's degree	141	44.3
Master's degree	22	6.9

ointment are often interchangeable for general consumers outside the pharmacist profession, as the terms used to represent the semi-solid form in the questionnaire was cream.

Over-the-counter medicines and medicines purchased without a prescription are widely available in pharmacies, supermarkets, the internet, and drug stores. Its availability means that customers can choose to purchase it without pharmacist involvement. The study shows that consumers prefer to buy topical analgesic

Table I. (Continued)

Category	Total (N)	Percentage (%)
Jobs/activities		
Private employee	118	37.1
Government employee	23	7.2
Student	80	25.2
Self-employed	71	22.3
Retired	3	0.9
Housewife	23	7.2
Working duration/day		
3-5	63	19.8
6-8	189	59.4
>8	66	20.8
Income per month		
<Rp1.500.000	58	18.2
Rp1.500.000-2.499.000	53	16.7
Rp2.500.000-3.499.000	129	40.6
≥Rp3.500.000	78	24.5

Table II. Topical Analgesic Drug Purchase History

Category	Total (N)	Percentage (%)	
Last time topical analgesic medication was purchased	< last 1 month	81	25.5
	Last 1 month	111	34.9
	Last 2 month	92	28.9
	Last 3 month	34	10.7
	Total	318	100
Dosage form of topical analgesic medication purchased*	Cream	190	59.7
	Patch	164	51.6
	Gel	135	42.5
	Spray	103	32.4
	Total	592	100
Place of purchase of topical analgesic*	Pharmacy	236	74.2
	Supermarket	148	46.5
	Drug Store	106	33.3
	e-Commerce	124	39.0
Total	614	100	

* Respondents can answer more than 1 answer, so that the number of answers can be more than the total number of respondents.

medication for musculoskeletal disorders at pharmacies compared to other places. This is most likely due to consumer trust in the product as well as advice that can be obtained from the pharmacist at the pharmacy. This research supports the study by Chan & Tran (2016)²⁶ about purchasing over-the-counter medicines in Australia. Chan & Tran (2016)²⁶ concluded that a high level of trust, confidence, and sense of altruism and care were key factors for customers buying drugs without a prescription at the pharmacy. In addition, consumers often consider medications available in pharmacies to be more effective and safe than those available in supermarkets, or health food stores.²⁷

Evaluation of the relationship independent variable (psychological, cultural, social, and personal factors) and dependent variable (purchasing decision) using multiple regression resulted in the following equation:

$$Y = 3.567 + 0.197X_1 + 0.105X_2 + 0.248X_3 + 0.336X_4$$

The results of multiple linear regression analysis show that the personal factor variable (X₄) has the highest coefficient value compared to other variables, so it can be concluded that personal factors have the highest influence compared to the influence of psychological, cultural, and social factors.

To find out how much relationship each independent variable has on the dependent variable with a confidence level of 95%, use the t-test which is based on a comparison between t-count and t-table, presented in Table III. The results show that each independent variable provided a t-calculated value greater than the t table ($p < 0.05$), which means it shows the influence of these variables on purchasing decisions.

Table III. The Correlation Between Variables

Variable	Coefficient	Sig.	Remarks
Constant Value	3.567	0.006	
Psychological Factors (X1)	0.197	0.000	Significant
Cultural Factors (X2)	0.105	0.021	Significant
Social Factors (X3)	0.248	0.000	Significant
Personal Factors (X4)	0.336	0.000	Significant

Analysis using F Test is a test carried out to determine the relationship between independent variables and the dependent variable simultaneously which is based on a comparison between F-calculated and F-table, presented in Table IV. The calculation results give an F-calculated of 92.43, higher than the F-table of 2.42 ($p < 0.05$). It can be concluded that all together independent variables have a significant influence on the decision to purchase topical analgesic drugs for musculoskeletal disorders. To determine how much variation occurs in the dependent variable by the independent variable, the R coefficient of determination test was carried out, and the resulting coefficient of determination value was Adjusted R-squared (R^2) of 0.536 or 53.6%.

Table IV. The Partial Correlation Between Variables

Variable	t-calculated	p-value
Constant Value	2.783	0.006*
Psychological Factors (X1)	5.728	0.000*
Cultural Factors (X2)	2.315	0.021*
Social Factors (X3)	6.408	0.000*
Personal Factors (X4)	5.752	0.000*

*Significant at $p < 0.05$

Individual consumer behavior includes selecting, purchasing, and consuming goods to meet certain needs. There are some factors on cultural, social, personal and psychological to customer purchase decisions. The study shows there are significant influences partially and simultaneously of cultural, social, personal, and psychological factors on consumer purchase decision of topical analgesic medication for musculoskeletal disorders. This study also shows that apart from other variables, the variables in this current study (psychological, cultural, social, and personal factors) contributed 53.6% to determining the decision to purchase topical analgesic drugs for sufferers of musculoskeletal disorders. The results obtained in this study are in line with research conducted by Saputri & Yuliani (2020)²⁸ which used the same variables as factors with the decision to purchase vitamin C supplement drugs.

Consumer behavior is often unpredictable. Understanding the complexities of consumer behavior is essential to developing effective marketing strategies.²⁹ Various theories have been developed and introduced to understand consumer behavior.^{30,18,31} Based on existing theories/models, consumer behavior in decision making can be a quick and easy or a lengthy and complicated process. Marketer must fully understand both the theory and reality of consumer behavior. Various factors can determine and change consumer behavior, including actions that consumers do or do not take due to internal or external influences.³² The present study was based on Kotler & Keller,¹⁶ consumer purchasing behavior was influenced by cultural, social and personal factors. The study shows that personal factors were the most influential factors among the cultural, social, personal, and psychological in purchasing decisions. The personal factors in this study were finances and personal perceptions of product quality and price. Personal perception plays a vital role in consumer behavior.³³ Perception is the way that individuals select and organize to develop their meaningful sense of the world. Generally, the most important personal factors marketers consider are age, occupation, finances, lifestyle, and self-concept. The study shows that apart from perception, finances were the most important factor in purchasing decisions. Other factors that are part of the personal factors were not detected in the results, since these factors were not part of the questions analyzed. Even though the number of participants was sufficient according to calculations, because the questionnaire was distributed online, the variety of participants was dominated by young people. Most of the distribution locations were still concentrated in Central Java, not evenly distributed throughout all regions in Indonesia. The questionnaire used was still far from perfect and still needs to be developed further to provide a clearer picture of the parts that determine purchasing decisions.

CONCLUSION

It can be concluded that psychological, cultural, social, and personal factors have a significant positive influence ($p < 0.05$) on the decision to purchase topical analgesic drugs among consumers who need medication for musculoskeletal disorders. Personal factors were the most influential factors in purchasing. By considering personal factors, such as financial and personal perceptions of quality product and prices, marketers can adjust their offerings to align with consumer preferences.

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CONFLICT OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article

STATEMENT OF ETHICS

This research has received approval from the Faculty Ethics Committee Medicine, Public Health and Nursing (FKKMK) Universitas Gadjah Mada with Number KE/FK/0068/EC/2023. A brief definitions and types of musculoskeletal disorders were provided to ensure that each respondent understood the study. Respondents were asked to state approval before filling out the questionnaire. Respondents' data was not included in the results to guarantee confidentiality.

REFERENCES

1. El-Tallawy SN, Nalamasu R, Salem GI, LeQuang JAK, Pergolizzi J V., Christo PJ. Management of Musculoskeletal Pain: An Update with Emphasis on Chronic Musculoskeletal Pain. *Pain Ther.* 2021;10(1):181-209. doi:10.1007/s40122-021-00235-2
2. Kemenkes RI. Hasil Riset Kesehatan Dasar Tahun 2018. *Kementrian Kesehatan RI.* 2018;53(9):1689-1699.
3. Cimmino MA, Ferrone C, Cutolo M. Epidemiology of chronic musculoskeletal pain. *Best Pract Res Clin Rheumatol.* 2011;25(2):173-183. doi:10.1016/j.berh.2010.01.012
4. Derry S, Wiffen PJ, Kalso EA, et al. Topical analgesics for acute and chronic pain in adults - an overview of Cochrane Reviews. *Cochrane Database Syst Rev.* 2017;2017(5). doi:10.1002/14651858.CD008609.pub2
5. Chang RK, Raw A, Lionberger R, Yu L. Generic development of topical dermatologic products: Formulation development, process development, and testing of topical dermatologic products. *AAPS J.* 2013;15(1):41-52. doi:10.1208/s12248-012-9411-0
6. Puig L, Carrascosa JM, Belinchón I, et al. Adherence and patient satisfaction with topical treatment in psoriasis, and the use, and organoleptic properties of such treatments: A delphi study with an expert panel and members of the psoriasis group of the spanish academy of dermatology and venereolo. *Actas Dermosifiliogr.* 2013;104(6):488-496. doi:10.1016/j.adengl.2012.12.003
7. Shariff Z, Kirby D, Missaghi S, Rajabi-Siahboomi A, Maidment I. Patient-centric medicine design: Key characteristics of oral solid dosage forms that improve adherence and acceptance in older people. *Pharmaceutics.* 2020;12(10):1-15. doi:10.3390/pharmaceutics12100905
8. Palmeira-de-Oliveira R, Oliveira AS, Rolo J, et al. Women's preferences and acceptance for different drug delivery routes and products. *Adv Drug Deliv Rev.* 2022;182:114133. doi:10.1016/j.addr.2022.114133
9. Ibrahim IR, Ibrahim MIM, Al-Haddad MS di. The influence of consumers' preferences and perceptions of oral solid dosage forms on their treatment. *Int J Clin Pharm.* 2012;34(5):728-732. doi:10.1007/s11096-012-9667-6
10. Alessandrini E, Gonakova M, Batchelor H, et al. Colour of Medicines and Children's Acceptability? A Systematic Literature Review of Children's Perceptions about Colours of Oral Dosage Forms †. *Pharmaceutics.* 2023;15(7). doi:10.3390/pharmaceutics15071992
11. Hummler H, Page S, Stillhart C, et al. Influence of Solid Oral Dosage Form Characteristics on Swallowability, Visual Perception, and Handling in Older Adults. *Pharmaceutics.* 2023;15(4). doi:10.3390/pharmaceutics15041315
12. Kabeya K, Satoh H, Hori S, Sawada Y. Experimental study on patient preferences regarding the shape and size of medical tablets and capsules using three-dimensionally printed plastic model formulations. *Patient*

- Prefer Adherence*. 2021;15:863-870. doi:10.2147/PPA.S306582
13. Hassan R, Siddique ZR. Factors affecting Consumer Purchase Decisions of Medicine without Prescriptions in OTC: A Study in Bangladesh. *Jahangirnagar J Mark*. 2018;6(February 2021):1-14. <https://www.researchgate.net/publication/349054911>.
 14. Arcaro R, da Veiga CRP, da Silva WV, da Veiga CP. Attitude and purchase intention to generic drugs. *Int J Environ Res Public Health*. 2021;18(9). doi:10.3390/ijerph18094579
 15. Neculai A. Analyzing Consumer Behavior towards Purchasing Pharmaceutical Products Online. 2022;XXII(1):659-666.
 16. Kotler P, Keller KL. *A Framework for Marketing Management*. Sixth Edit. London, England: Pearson Education © 2016.; 2016.
 17. Ortiz MI, Molina MAR, Arai YCP, Romanò CL. Analgesic drugs combinations in the treatment of different types of pain. *Pain Res Treat*. 2012;2012:2-3. doi:10.1155/2012/612519
 18. Manuere HT, Chikazhe L, Manyeruke J. Theoretical Models of Consumer Behaviour: a Literature Review. *Int J Educ Humanit Soc Sci*. 2022;05(02):105-112. doi:10.54922/ijehss.2022.0368
 19. Roquelaure Y. Musculoskeletal disorders and psychosocial factors at work. *ETUI Res Pap*. 2018;142.
 20. Paddison A, Olsen K. Painkiller purchasing in the UK: An exploratory study of information search and product evaluation. *Int J Pharm Healthc Mark*. 2008;2(4):284-306. doi:10.1108/17506120810922330
 21. Ruse AV, Cristea MA, Ciobanu OM, Roman PA. Decision Making Factors In Purchasing The Analgesics Brands On Romanian Pharmaceutical Market. *Ann Univ Oradea Econ Sci*. 2019;(2):321-329. <https://anale.steconomiceuoradea.ro/volume/2019/n2/32.pdf>.
 22. Garg T, Rath G, Goyal AK. Comprehensive review on additives of topical dosage forms for drug delivery. *Drug Deliv*. 2015;22(8):969-987. doi:10.3109/10717544.2013.879355
 23. Semi-Solid and Semi-Liquid Dosage Forms: What to Know. <https://ascendiapharma.com/newsroom/semi-solid-semi-liquid-dosage-forms>. Accessed November 11, 2023.
 24. Buhse L, Kolinski R, Westenberger B, et al. Topical drug classification. *Int J Pharm*. 2005;295(1-2):101-112. doi:10.1016/j.ijpharm.2005.01.032
 25. Maqbool A, Mishra M, Pathrak S, Kesharwani A. Semi solid dosage forms manufacturing: tools, critical process parameters, strategies, optimization and recent advances. *Indo Am J Pharamceutical Res*. 2017;7(11).
 26. Chan V, Tran H. Purchasing Over-the-counter medicines from Australian pharmacy: What do the pharmacy customers value and expect? *Pharm Pract (Granada)*. 2016;14(3):782. doi:10.18549/PharmPract.2016.03.782
 27. Tran S, Calabretto JP, Sorich M. Consumer-pharmacist interactions around complementary medicines: Agreement between pharmacist and consumer expectations, satisfaction and pharmacist influence. *Int J Pharm Pract*. 2013;21(6):378-385. doi:10.1111/ijpp.12027
 28. Saputri R, Yuliani E. Faktor-faktor yang mempengaruhi konsumen dalam pengambilan keputusan pembelian produk suplemen Vitamin C di Bojonegoro. *JAPRI (Jurnal Penjas dan Farm*. 2020;3:44-52. <http://journal.unugiri.ac.id/index.php/JAPRI/article/download/161/98>.
 29. OpenCourseWare UPJ. Psychological Influences on Consumer Behavior. <http://www.ocw.upj.ac.id/files/Slide-PSY209-PSY209-Slide-03-04-2021.pdf>. 2021. <https://www.ocw.upj.ac.id/files/Slide-PSY209-PSY209-Slide-03-04-2021.pdf>.
 30. Roy P. Theory and Models of Consumer Buying Behaviour: A Descriptive Study. *SSRN Electron J*. 2022;(August). doi:10.2139/ssrn.4205489
 31. Reina Paz MD, Rodríguez Vargas JC. Main theoretical consumer behavioural models. A review from 1935 to 2021. *Heliyon*. 2023;9(3):e13895. doi:10.1016/j.heliyon.2023.e13895
 32. Šostar M, Ristanović V. Assessment of Influencing Factors on Consumer Behavior Using the AHP Model. *Sustain*. 2023;15(13). doi:10.3390/su151310341
 33. Inabo S. Customer perception: Definition, importance & how to improve it. <https://www.zendesk.com/blog/simple-guide-customer-perception/>. Published 2023. Accessed November 11, 2023.