



LITERATUR REVIEW: CONSUMER PROTECTION IN TRANSACTIONS OF TARTAR REMOVAL PRODUCTS ON E-COMMERCE: A LEGAL AND POLICY REVIEW

Ida Ayu Dinda Laksmi*, I Nyoman Bagiastra, Luh Nyoman Alit Aryani

Master of Health Law, Universitas Udayana, Jalan P.B. Sudirman, Dangin Puri Klod, Denpasar Barat, Denpasar, Bali 80234, Indonesia

*dindapidada10@gmail.com

ABSTRACT

The rapid growth of e-commerce has significantly transformed consumer purchasing behavior, including in the health and personal care sectors. However, the online sale of tartar removal products raises serious concerns regarding consumer protection, product safety, and regulatory oversight. This study aims to examine the adequacy of the existing legal framework and policy mechanisms in protecting consumers who purchase tartar removal products through e-commerce platforms. **Methods:** This research employed a literature review design using a comprehensive strategy. Articles were sourced from international research journal databases accessed via the internet, specifically ScienceDirect, PubMed, and Google Scholar. All searches were conducted in March 2025, focusing on articles published between 2016 and 2024. The keywords used in this literature review were adapted from Medical Subject Heading (MeSH) terms, including "consumer protection in e-commerce transactions," "tartar removal products," "e-commerce platforms," and "legal and policy aspects." The initial search yielded 1098 results, of which 711 were duplicates. Of the 387 remaining results, 29 were retained after a title and abstract review. Following a full-text review, 11 articles were included in the study. Charting and theme identification were conducted by a single author (R.C-D). **Results:** The study identified major challenges, notably the lack of legal protection for consumers. The absence or weakness of legal safeguards in transactions involving tartar removal products has led to several significant issues, including misleading product claims, a lack of mandatory certification, limited enforcement capacity, and inadequate digital infrastructure for transaction monitoring. By analyzing relevant laws, regulations, and case studies, this study highlights the gaps in current consumer protection practices and proposes policy recommendations to strengthen legal protection. These include reinforcing regulatory frameworks, enhancing technology-based monitoring, and promoting consumer education initiatives. **Conclusion:** The findings emphasize the need for a more adaptive and proactive legal approach to create a safer e-commerce environment, particularly in sectors impacting public health.

Keywords: e-commerce; online transactions; legal and policy aspects; legal protection; tartar removal products

How to cite (in APA style)

Laksmi, I. A. D., Bagiastra, I. N., & Aryani, L. N. A. (2025). Literatur Review: Consumer Protection in Transactions of Tartar Removal Products on E-Commerce: A Legal and Policy Review. *Indonesian Journal of Global Health Research*, 7(4), 189-198. <https://doi.org/10.37287/ijghr.v7i4.6316>.

INTRODUCTION

The rapid advancement of digital technology has significantly transformed the global marketplace, leading to a surge in e-commerce transactions (Ahmad Angga Tiaz Pratama & Rani Apriani, 2024; Fista et al., 2023). Consumers increasingly prefer online shopping due to its convenience, variety, competitive pricing, and ease of access (Ahmad Angga Tiaz Pratama & Rani Apriani, 2024). This shift has not only altered traditional retail dynamics but also introduced various regulatory and consumer protection challenges (Musmualim et al., 2024). Among the wide array of products available online, health-related products, including tartar removal products, have gained popularity (Schemehorn et al., 2011). These products are marketed as effective solutions for dental hygiene, offering consumers an alternative to professional dental treatments. However, the unregulated nature of e-commerce platforms has raised concerns regarding product safety, efficacy, and consumer rights (Bosma et al., 2018; Schemehorn et al., 2011).

The rising incidence of periodontal disease has led to an increasing demand for dental tartar removal (Schemehorn et al., 2011). Approximately 20-50% of the global population is affected by periodontal diseases, with severe cases impacting around 19% of adults worldwide (Nazir, 2017). In the United States, nearly 42% of adults have experienced periodontal disease. The prevalence of periodontal disease increases with age, affecting 47% of adults aged 30 and older, and rising to 70% among those aged 65 and above (Noah S. Gasner & Ryan S. Schure., 2023).

Tartar removal products, such as ultrasonic scalers, dental picks, and chemical-based plaque removers, are increasingly advertised and sold through online marketplaces (Schemehorn et al., 2011). These products often claim to provide professional-level dental care at a fraction of the cost. While some may be legitimate and meet safety standards, many are imported without proper regulatory approval, lack scientific validation, or do not provide clear usage instructions (Bosma et al., 2018). Consequently, consumers may unknowingly purchase products that could harm their oral health rather than improve it. The ease of access to such products, coupled with aggressive marketing strategies, has raised concerns among healthcare professionals and regulators (Schemehorn et al., 2011). In Indonesia, the demand for affordable dental care products is high due to the limited accessibility of professional dental services, especially in rural areas (Bosma et al., 2018). Many individuals opt for self-administered dental treatments, believing that online-purchased products can replace professional care. This trend underscores the need for stringent consumer protection policies to ensure the safety and efficacy of tartar removal products in the e-commerce ecosystem (Bosma et al., 2018; Schemehorn et al., 2011).

Indonesia has established a legal framework to safeguard consumer rights in both traditional and digital markets (Edward Zeth Daud & Heru Suyanto, 2024; Fista et al., 2023). The primary legal instrument governing consumer protection is Law No. 8 of 1999 on Consumer Protection (Undang-Undang Perlindungan Konsumen/UU PK), which ensures consumers' rights to safety, information, and compensation in case of harm (Barkatullah & Djumadi, 2018; Rinitami Njatrijani, 2017). This law mandates that businesses provide accurate product descriptions, maintain quality standards, and assume liability for damages caused by defective or hazardous products (Edward Zeth Daud & Heru Suyanto, 2024; Santoso, 2021). Additionally, Government Regulation No. 80 of 2019 on Trade Through Electronic Systems (Peraturan Pemerintah No. 80 Tahun 2019 tentang Perdagangan Melalui Sistem Elektronik) (Edward Zeth Daud & Heru Suyanto, 2024; Rosianna Evanesa Sihombing & Made Gede Subha Karma Resen, 2024) regulates e-commerce transactions by setting requirements for online businesses, including product authenticity, seller accountability, and consumer dispute resolution mechanisms. These regulations are crucial for addressing fraudulent activities, misleading advertisements, and substandard product distribution. However, challenges persist in enforcing these laws effectively in the digital marketplace (Dijan Widijowati, 2023; Rosianna Evanesa Sihombing & Made Gede Subha Karma Resen, 2024). Despite existing regulations, several challenges hinder consumer protection in the e-commerce sector, particularly for health-related products like tartar removal tools. Some of the key issues include: (1) Lack of Product Regulation and Standardization, (2) Misleading Advertising and False Claims, (3) Difficulties in Holding Sellers Accountable, (4) Consumer Unawareness and Lack of Dental Health Knowledge, (5) Inadequate Enforcement of E-Commerce Regulations.

To address the challenges associated with the sale of tartar removal products online, policymakers must enhance consumer protection measures through several strategic approaches: (1) Stricter Product Registration and Quality Control; Regulatory agencies should implement mandatory registration and safety certification for all dental care products sold

online. E-commerce platforms should be required to verify product compliance with BPOM or other relevant authorities before allowing listings. (2) Enhanced Oversight of E-Commerce Platforms; Marketplaces such as Tokopedia, Shopee, and Lazada should be held accountable for ensuring that all sellers comply with consumer protection regulations. Implementing stricter verification processes, seller audits, and product monitoring systems can help prevent the sale of unsafe products. (3) Public Awareness and Education Campaigns; Educating consumers about the risks associated with self-administered dental treatments and the importance of professional dental care can help prevent misuse of tartar removal products. Government agencies, dental associations, and consumer advocacy groups should collaborate to disseminate accurate information through social media, websites, and community outreach programs. (4) Stronger Penalties for Non-Compliant Sellers; Introducing harsher penalties for sellers who distribute counterfeit, substandard, or misleadingly advertised products can deter fraudulent activities. Legal actions should be taken against vendors who violate consumer protection laws, both domestic and international sellers. (5) Improved Consumer Complaint and Redress Mechanisms; Establishing efficient and accessible complaint-handling systems can empower consumers to report unsafe products and seek compensation when harmed. E-commerce platforms should provide clear refund policies, while regulatory agencies should facilitate dispute resolution mechanisms for affected buyers. Based on the above, this research aims to investigate the protection of consumers in e-commerce transactions involving dental scaling products, with a focus on legal and policy reviews."

METHOD

Identify The Research Question

The research question investigated in this literature review was: What is known in the existing literature about examine consumer protection in transactions involving tartar removal products on e-commerce platforms, focusing on legal and policy aspects? This research question was intentionally broad to align with the purpose of the literature review, which aimed to include multiple concepts and provide researchers with a deeper understanding of consumer protection in transactions involving tartar removal products on e-commerce platforms, focusing on legal and policy aspects.

Identify Relevant Studies

The research employed a literature review design using a comprehensive strategy. Articles were sourced from international research journal databases accessed via the internet, specifically ScienceDirect, PubMed, and Google Scholar. All searches were conducted in March 2025, focusing on articles published between 2016 and 2024. The keywords used in this literature review were adapted from the Medical Subject Heading (MeSH) terms, including "consumer protection in e commerce transaction," "tartar removal products," "e-commerce platforms," and "legal and policy aspects."

Study Selection

The initial search yielded 1098 results, of which 711 were duplicates. Hand-searching relevant journal articles added one unique article. Of the 387 remaining results, 29 were retained after a title and abstract review. Following a full-text review, 11 articles were included in the study. A PRISMA flowchart outlining the search process is presented in Figure 1. Articles were included if they met all the following criteria: 1) peer-reviewed journal articles, 2) consumer protection in e commerce transactions, (3) tartar removal products on e-commerce platforms, (4) legal frameworks related to consumer rights, and 5) empirical studies of any design, including qualitative, quantitative, or mixed method. Exclusions were articles not in consumer protection in transactions, and were solely about students or existing literature reviews. No date limits were applied to include all relevant literature. The database search and hand-searching were conducted by one reviewer (R.C-D). Title and abstract reviews, as well as full-

text reviews, were conducted independently by two reviewers (R.C-D. and I.K-N.), with any conflicts resolved by consensus or a third reviewer (N.K-S). A minimum of two reviewers participated in each stage to reduce bias (H. Snyder, 2019).

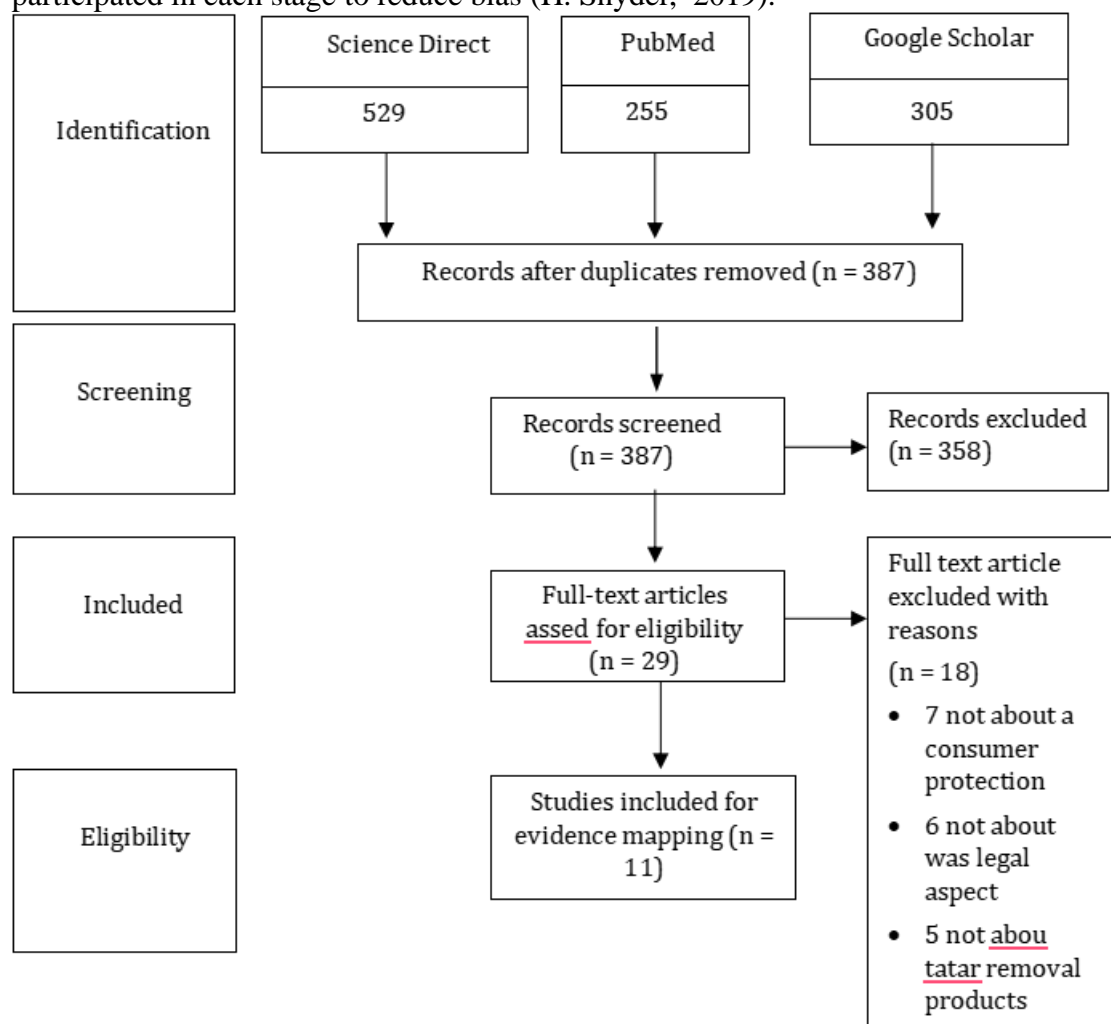


Figure 1. Literature Search Flow Chart Diagram

Charting the Data

Data in the literature review were logically and descriptively charted, ensuring relevance to the research question. A form for charting data was developed based on the study by Peters et al., high suggested extraction fields for systematic literature reviews. Table 1 lists the included articles and the extracted data. From these data, three themes were identified, lack of legal protection for consumers, lack of technology and infrastructure in monitoring and evaluating transactions and policy recommendations and the way forward. These themes were recurrent across the articles and relevant to the research question. The initial search yielded 1098 results, of which 711 were duplicates. Hand-searching relevant journal articles added one unique article. Of the 387 remaining results, 29 were retained after a title and abstract review. Following a full-text review, 11 articles were included in the study. Charting and theme identification were conducted by a single author (R.C-D). Note that the total number of themes exceeded the number of included articles, as most articles addressed multiple themes.

Collating, Summarising, and Reporting the Results

The 11 identified articles focused tartar removal products on consumers protection in e commerce transaction. Two studies used qualitative approach, five employed a normative juridical legal research howed a good distribution of international sources, covering three countries. The Indonesia contributed the highest number of studies (7), followed by India (2). The remaining countries each contributed one study, as summarized in Table 1.

Table 1.

Studies selected for inclusion and extracted data

No	Author, Year, Place	Objective	Methods	Outcome
1	Nurul Fibrianti, 2017(Nurul Fibrianti, 2017)	identify and analyze how the government as one element of consumer protection to provide protection for consumers in electronic transactions	a legal policy research with a qualitative approach with grounded research model	consumer protection less than the maximum because there are no special arrangements registration mechanism for businesses online shop and the lack of public access to information related to the existence of businesses online shop so that potential violations of consumer rights.
2	Mwasomola, et al., 2020(Ulimboka L. Mwasomola et al., 2020)	assess consumer protection and comprehensiveness in e-commerce in Tanzania	Mixed research method was used to collect data from the study area, including, 210 respondents and 2 key informant interviews.	the legal framework in Tanzania does not offer tight protection to online consumers exposing them to various online vices. Because of this, majority citizens have opted not to engage in online business due to fear of being negatively affected from online businesses or suppliers.
3	Widijowati, 2023(Dijan Widijowati, 2023)	the existing legal framework for consumer protection in electronic transactions in Indonesia and highlights the need for effective measures to address risks related to data security, privacy, fraud, and consumer trust	The study utilizes a comprehensive methodology combining normative and empirical juridical approaches to analyze relevant legal texts and secondary data sources.	the importance of upholding consumer rights, promoting fair business practices, and providing avenues for resolving disputes in order to nurture trust, responsibility, and fair commerce practices in the online marketplace
4	Sihombing, 2023(Rosianna Evanesa Sihombing & Made Gede Subha Karma Resen, 2024)	analyze consumer protection in e-commerce in Indonesia, focusing on the obstacles in implementing consumer protection regulations in e-commerce in Indonesia.	This research employs a normative-descriptive research method, utilizing both the statute approach and the conceptual approach.	although regulations related to e-commerce are in place, the main challenge lies in the less-than-optimal implementation and oversight. Obstacles such as a lack of human resources and monitoring technology, as well as the complexity of cross-border jurisdictions, are factors that complicate effective consumer protection. Therefore, there is a need for efforts to improve legal infrastructure and stricter oversight to ensure that consumer rights are protected within the e-commerce ecosystem in Indonesia.
5	Shaik & Poojasree, 2020 (India) (Shaik & Poojasree, 2021)	To examine the veracity of legal and ethical issues , the legal framework of International Laws	this research involves a socio-legal and a conceptual study, the methodology	Therefore, for proper functioning of E-Commerce, Consumer and merchant security is of prime importance. There are laws governing the purchasing and

No	Author, Year, Place	Objective	Methods	Outcome
		relating to unfair trade, the redressable options available to online consumers and the jurisdictional aspect to resolve disputes arising in E-Commerce	involved is Doctrinal research. This method includes a careful analysis of various issues involved with E-Commerce.	selling of products within E-Commerce zone. But when it comes to virtual world, such as second life then and there are no laws which a merchant has to abide by.
6	Musmualim1, Fokky Fuad2, Suartini, 2024 (Indonesia)(Musmualim et al., 2024)	<i>This study aims to analyze the legal framework that regulates consumer protection in e-commerce transactions in Indonesia.</i>	<i>This research uses a normative juridical method</i>	<i>legal protection for consumers in e-commerce transactions in the digital era is regulated in Law Number 8 of 1999 concerning Consumer Protection. Consumer protection includes effective dispute resolution mechanisms, such as mediation or arbitration, as well as legal procedures if necessary.</i>
7	Daud & Suyanto, 2022 (Indonesia)(Edward Zeth Daud & Heru Suyanto, 2024)	To analyze the legal protection on consumers of e-commerce transactions in Indonesia	The method used in this research was an empirical normative legal approach	the form of legal protection for consumers in e-commerce transactions has been regulated based on the provisions of statutory regulations which have been contained in Law No. 8 of 1999 concerning Consumer Protection (UUPK), then in purchasing and selling transactions, although carried out online, based on the ITE Law and PP PSTE, it is still recognized as an electronic transaction that can be accounted for through an electronic contract.
8	Pratama & Apriani, 2024(Ahmad Angga Tiaz Pratama & Rani Apriani, 2024)	<i>This study discusses consumer protection in e-commerce transactions using a qualitative approach.</i>	A qualitative study approach	<i>The results of the study show that there are several regulations governing consumer protection in e-commerce transactions, such as Law no. 8 of 1999 concerning Consumer Protection and Government Regulation no. 82 of 2012 concerning Implementation of Electronic Systems and Transactions</i>
9	Fista, et al., 2023(Fista et al., 2023)	This study discusses the regulation of consumer legal protection in e-commerce transactions and the problems faced.	This research uses a normative legal research method or what was known as library research.	Consumer protection regulations have not yet been effective in preventing fraud committed by businesses in electronic transactions. The existence of consumer protection laws is expected to prevent crimes committed by businesses and serve as a legal safeguard for consumers.
10	Abdul Halim Barkatullah & Djumadi, 2018 (Barkatullah & Djumadi, 2018)	This study analyzes self-regulation as an effective means for	Using the normative legal research method	The United States focuses on a model of self-regulation, while the European Union places more emphasis on the United

No	Author, Year, Place	Objective	Methods	Outcome
		providing legal protection and consumer security in e-commerce transactions.		State' role through legislation that provides legal protection for e-commerce consumers, and Indonesia has not yet specifically regulated the protection of data privacy or used self-regulation in e-commerce transactions. Self-regulation by business actors is urgent to ensure consumer rights in e-commerce transactions are fulfilled.
11	Sumei Zhuang, (Zhuang, 2024)	2024 This article analyzes the privacy protection and immersive business experience simulation of e-commerce consumers based on intrusion detection algorithms.	explores the significance and current status of intrusion detection algorithms, as well as the research status of <u>deep learning</u> in this field, and conducts comparative experiments on improved intrusion detection algorithms	a new personal privacy protection model was successfully constructed, which verified the great advantages of the algorithm in terms of running time, and concluded that using intrusion detection algorithms can greatly protect the personal privacy of e-commerce consumers using public networks.

RESULT

The review includes 11 articles that discuss lack of legal protection for consumers. The absence or weakness of legal protection for consumers in transactions involving tartar removal products leads to several significant issues. The article discusses about lack of legal protection for consumers is number 1 and 4. In outline, lack of technology and infrastructure in monitoring and evaluating transactions is the second thema. The inadequate development of technology and infrastructure for monitoring and evaluating e-commerce transactions significantly hampers consumer protection efforts. Without sophisticated digital monitoring tools, authorities struggle to detect fraudulent activities, verify product authenticity, and ensure compliance with consumer protection standards. To strengthen consumer protection in e-commerce transactions involving tartar removal products, several policy measures are recommended. A collaborative approach involving government agencies, e-commerce platforms, consumer protection organizations, and the public is crucial to building a safer online shopping environment. Future initiatives should focus on adopting adaptive regulatory models, leveraging artificial intelligence for transaction monitoring, and continuously updating legal standards in response to emerging digital marketplace trends

DISCUSSION

The rapid expansion of e-commerce has revolutionized consumer purchasing behaviors, allowing individuals to access a wide range of products, including oral healthcare items such as tartar removal products. While this growth has provided consumers with convenience and variety, it has also introduced significant challenges concerning consumer protection. One of the most pressing concerns is the sale of unregulated and potentially unsafe tartar removal products that claim to offer dental benefits without adequate clinical validation. This issue is further compounded by the lack of robust legal protections for consumers, insufficient

technology, and inadequate infrastructure for monitoring and evaluating these transactions. This article explores the key legal and policy challenges surrounding consumer protection in e-commerce transactions of tartar removal products, emphasizing the lack of legal safeguards for consumers and the shortcomings in monitoring and enforcement mechanisms (Kim, 2019).

Lack of Legal Protection for Consumers

One of the primary concerns regarding consumer protection in the sale of tartar removal products on e-commerce platforms is the absence of comprehensive legal frameworks to regulate these transactions. Many countries have general consumer protection laws that aim to ensure fair trade practices, but these laws often fail to specifically address the sale of health-related products online (Putra Wathan, 2023). For instance, regulations governing medical devices or pharmaceuticals may not clearly classify tartar removal products, especially those marketed as cosmetic or over-the-counter solutions. This legal gray area allows sellers to exploit regulatory loopholes, selling products that may not be subject to stringent quality and safety standards. Consumers, unaware of the potential risks, may purchase products that could cause oral damage, ineffective treatment, or adverse health reactions (Rolland, 2016). Moreover, consumer protection laws in many jurisdictions lack specific provisions for cross-border transactions, which is a prevalent characteristic of e-commerce. Products sold by international vendors may not comply with local safety regulations, yet they are readily available to consumers. In cases where consumers receive substandard or harmful products, seeking legal redress can be complicated due to jurisdictional issues. The process of filing complaints, obtaining refunds, or seeking compensation is often burdensome, leaving many consumers with little recourse against fraudulent or negligent sellers (Shaik & Poojasree, 2021).

Another significant issue is the lack of transparency in product labeling and advertising. Many tartar removal products available on e-commerce platforms use misleading claims, falsely assuring consumers of their effectiveness or safety without scientific evidence. Regulatory agencies, such as the Food and Drug Administration (FDA) in the United States or the European Medicines Agency (EMA), have limitations in enforcing regulations on global e-commerce platforms. As a result, deceptive marketing practices continue to flourish, further exposing consumers to potential harm (Putra Wathan, 2023).

Lack of Technology and Infrastructure in Monitoring and Evaluating Transactions

Effective consumer protection in e-commerce requires robust monitoring and evaluation mechanisms, which depend on advanced technology and infrastructure. Unfortunately, many regulatory bodies struggle to keep pace with the rapidly evolving digital marketplace due to inadequate technological tools and limited resources (Zhuang, 2024). One of the main challenges in monitoring online sales of tartar removal products is the vast number of sellers operating across multiple e-commerce platforms. Automated monitoring systems that analyze product listings, customer reviews, and seller credibility are still in their infancy in many regulatory agencies. As a result, harmful or misleading products may remain available for purchase despite violating consumer protection standards (Ehikioya & Guillemot, 2020). Additionally, the lack of standardized digital databases for product verification exacerbates the problem. A centralized system that allows consumers and regulatory authorities to verify the authenticity and approval status of tartar removal products could significantly improve safety and compliance. However, the implementation of such a system requires substantial investment in technology, collaboration among international regulatory agencies, and cooperation from e-commerce platforms (Gundur et al., 2021).

Moreover, many countries lack the necessary infrastructure to systematically evaluate consumer complaints and take swift action against fraudulent sellers. While major e-

commerce platforms such as Amazon and eBay have reporting mechanisms for unsafe products, the effectiveness of these systems is often limited. Consumers frequently encounter delays in response times, inadequate resolutions, and difficulties in navigating complaint procedures. Smaller e-commerce platforms, especially those operating in developing countries, may lack even the basic mechanisms for addressing consumer grievances, further exacerbating the issue (*Consumer Protection in Asean's E-Commerce: Common Issues and the Path towards Harmonization of Regulatory Frameworks*, 2023). Artificial intelligence (AI) and machine learning could play a pivotal role in strengthening consumer protection by detecting fraudulent sellers and analyzing product trends. However, the adoption of these technologies in regulatory agencies remains slow due to budgetary constraints and the complexity of implementing AI-driven enforcement mechanisms (Ezeji, 2024; Odufisan et al., 2025).

Policy Recommendations and the Way Forward

To enhance consumer protection in e-commerce transactions involving tartar removal products, governments and regulatory bodies must adopt a multi-faceted approach that combines legal reforms, technological advancements, and strengthened enforcement mechanisms. Below are key recommendations to address the identified challenges (*Consumer Protection in Asean's E-Commerce: Common Issues and the Path towards Harmonization of Regulatory Frameworks*, 2023):

(1) *Strengthening Legal Frameworks* : Governments should update consumer protection laws to specifically regulate the online sale of health-related products, including tartar removal solutions. Clear guidelines must be established for product classification, ensuring that tartar removal products meet defined safety and efficacy standards before being marketed to consumers. International cooperation among regulatory agencies should be strengthened to address cross-border e-commerce challenges and ensure product compliance across different jurisdictions.

(2) *Enhancing Monitoring and Enforcement Technologies*: Regulatory agencies should invest in AI-driven monitoring systems to automatically scan e-commerce platforms for potentially unsafe or misleading products. The development of a global product verification database would allow consumers to check the legitimacy of tartar removal products before purchase. E-commerce platforms should be required to implement stricter seller verification processes, ensuring that only reputable vendors with compliant products are allowed to operate.

(3) *Improving Consumer Awareness and Access to Remedies*: Public awareness campaigns should be launched to educate consumers on the risks associated with unverified tartar removal products and how to identify safe options. Simplified complaint resolution mechanisms must be established, ensuring that consumers can report fraudulent products easily and receive timely assistance. Strengthening legal avenues for consumer redress, including facilitating class-action lawsuits against negligent sellers, could deter the sale of unsafe products.

Limitation Of Research

This study is limited to the analysis of consumer protection in transactions involving tartar removal products sold through e-commerce platforms. The research primarily focuses on the Indonesian legal framework, particularly relevant consumer protection laws and e-commerce regulations. It does not provide an in-depth examination of clinical safety or the medical efficacy of tartar removal products. Furthermore, the study is based on secondary data such as legislation, court decisions, and academic literature, without conducting empirical field research or direct interviews with consumers or sellers. The scope is restricted to products marketed to individual consumers and does not cover business-to-business (B2B) transactions. Additionally, due to the rapid development of e-commerce and digital regulations, the findings may be subject to changes based on future legal reforms.

Implication

This research highlights the urgent need for stronger legal frameworks and enforcement mechanisms to protect consumers purchasing tartar removal products through e-commerce platforms. The findings suggest that clearer regulatory standards and stricter monitoring of product claims are necessary to prevent consumer deception and potential health risks. Policymakers are encouraged to update existing consumer protection laws to specifically address the unique challenges of online health-related product sales. For businesses, the study emphasizes the importance of ethical marketing practices and compliance with product safety standards. Future research could further support these implications by conducting empirical studies on consumer experiences and by evaluating the effectiveness of regulatory interventions over time.

CONCLUSION

The growing popularity of tartar removal products on e-commerce platforms highlights the urgent need for improved consumer protection measures. The lack of adequate legal safeguards, coupled with deficiencies in technology and infrastructure for monitoring transactions, places consumers at risk of purchasing unsafe products. Addressing these challenges requires a coordinated effort among governments, regulatory bodies, e-commerce platforms, and consumers themselves. By strengthening legal frameworks, investing in advanced monitoring technologies, and enhancing consumer awareness, policymakers can create a safer online marketplace for oral healthcare products. Ultimately, protecting consumers in digital transactions is not just a legal obligation but also a critical step toward ensuring public health and trust in e-commerce.

REFERENCES

- Ahmad Angga Tiaz Pratama, & Rani Apriani. (2024). *Perlindungan Konsumen dalam Transaksi E-Commerce: Kajian Hukum Dagang dan Hukum Perlindungan Konsumen*. *Jurnal Ilmiah Wahana Pendidikan*, 10(23), 1166–1176.
- Barkatullah, A. H., & Djumadi. (2018). Does self-regulation provide legal protection and security to e-commerce consumers? *Electronic Commerce Research and Applications*, 30, 94–101. <https://doi.org/10.1016/j.elerap.2018.05.008>
- Bosma, M.-L., Milleman, K. R., Akwagyiram, I., Targett, D., & Milleman, J. L. (2018). A randomised controlled trial to evaluate the plaque removal efficacy of sodium bicarbonate dentifrices in a single brushing clinical model. *BDJ Open*, 4, 17037. <https://doi.org/10.1038/s41405-018-0003-7>
- Consumer protection in Asean's E-commerce: common issues and the path towards harmonization of regulatory frameworks. (2023). [Chulalongkorn University]. <https://doi.org/10.58837/CHULA.THE.2023.1248>
- Dijan Widijowati. (2023). Enhancing Consumer Protection in Electronic Commerce Transactions . *Research Horizon*, 3(4), 283–290.
- Edward Zeth Daud, & Heru Suyanto. (2024). The Legal Protection on Consumers of E-Commerce Transactions in Indonesia (Edward Zeth Daud & Heru Suyanto). *Law Development Journal*, 6(2), 266–278.
- Ehikioya, S. A., & Guillemot, E. (2020). A critical assessment of the design issues in e-commerce systems development. *Engineering Reports*, 2(4). <https://doi.org/10.1002/eng2.12155>

- Ezeji, C. L. (2024). Artificial Intelligence for detecting and preventing procurement fraud. *International Journal of Business Ecosystem & Strategy* (2687-2293), 6(1), 63–73. <https://doi.org/10.36096/ijbes.v6i1.477>
- Fista, Y. L., Aris Machmud, & Suartini, S. (2023). Perlindungan Hukum Konsumen Dalam Transaksi E-commerce Ditinjau dari Perspektif Undang-Undang Perlindungan Konsumen. *Binamulia Hukum*, 12(1), 177–189. <https://doi.org/10.37893/jbh.v12i1.599>
- Gundur, R. V., Levi, M., Topalli, V., Ouellet, M., Stolyarova, M., Chang, L. Y.-C., & Mejía, D. D. (2021). Evaluating Criminal Transactional Methods in Cyberspace as Understood in an International Context. *CrimRxiv*. <https://doi.org/10.21428/cb6ab371.5f335e6f>
- H. Snyder, (2019). “Literature review as a research methodology: An overview and guidelines,” *Journal of Business Research*, vol. 104. pp. 333–339, doi: 10.1016/j.jbusres.2019.07.039.
- Kim, H. (2019). Globalization and regulatory change: The interplay of laws and technologies in E-commerce in Southeast Asia. *Computer Law & Security Review*, 35(5), 105315. <https://doi.org/10.1016/j.clsr.2019.03.009>
- M. D. J. Peters, C. M. Godfrey, H. Khalil, P. McInerney, D. Parker, and C. B. Soares, (2015). “Guidance for conducting systematic scoping reviews,” *Int. J. Evid. Based. Healthc.*, vol. 13, no. 3, pp. 141–146, Sep. 2015, doi: 10.1097/XEB.0000000000000050.
- Musmualim, Fokky Fuad, & Suartini. (2024). Legal Protection for Consumers In Transactions E-Commerce by Era Digital. *Journal Eduvest*, 4(12), 11935–11943.
- Nazir, M. A. (2017). Prevalence of periodontal disease, its association with systemic diseases and prevention. *International Journal of Health Sciences*, 11(2), 72–80.
- Noah S. Gasner, & Ryan S. Schure. (2023). *Periodontal Diseases*. StatPearls Publishing.
- Nurul Fibrianti. (2017). Consumer Protection In Electronic Transactions . *International Journal of Business, Economics and Law*, 124.
- Odufisan, O. I., Abhulimen, O. V., & Ogunti, E. O. (2025). Harnessing artificial intelligence and machine learning for fraud detection and prevention in Nigeria. *Journal of Economic Criminology*, 7, 100127. <https://doi.org/10.1016/j.jeconc.2025.100127>
- Putra Wathan, F. (2023). Legal Effectiveness In Providing Consumer Protection For Online Sales And Purchase At Ecommerce. *Journal Research of Social Science, Economics, and Management*, 2(11). <https://doi.org/10.59141/jrssem.v2i11.462>
- Rinitami Njatrijani. (2017). POSISI UNDANG-UNDANG PERLINDUNGAN KONSUMEN NOMOR 8 TAHUN 1999 DALAM UPAYA PERLINDUNGAN TERHADAP KONSUMEN . *DIPONEGORO PRIVATE LAW REVIEW*, 1(1).
- Rolland, S. E. (2016). Consumer protection issues in cross-border ecommerce. In *Research Handbook on Electronic Commerce Law*. Edward Elgar Publishing. <https://doi.org/10.4337/9781783479924.00036>
- Rosianna Evanesa Sihombing, & Made Gede Subha Karma Resen. (2024). Perlindungan Konsumen dalam E-Commerce di Indonesia (Hambatan Penerapan Regulasi Antara Penerapan Dan Pengawasan). *Aliansi: Jurnal Hukum, Pendidikan Dan Sosial Humaniora*, 1(6), 58–70. <https://doi.org/10.62383/aliansi.v1i6.539>

- Santoso, V. A. (2021). Legal Protection on E-Commerce Transactions: Problems and Challenges in Global Business. *Semarang State University Undergraduate Law and Society Review*, 1(2), 101–112. <https://doi.org/10.15294/lsr.v1i2.50552>
- Schemehorn, B. R., Moore, M. H., & Putt, M. S. (2011). Abrasion, polishing, and stain removal characteristics of various commercial dentifrices in vitro. *The Journal of Clinical Dentistry*, 22(1), 11–18.
- Shaik, D., & Poojasree, Ms. V. (2021). Consumer Protection in E-Commerce: A Legal and Compliance Framework in the Digital Market. <https://doi.org/10.2991/assehr.k.210506.004>
- Ulimboka L. Mwasomola, Enock Ojwang, & Dickson Pastory. (2020). Examining the Consumer Protection And Comprehensiveness In E-Commerce in Tanzania. *Business Education Journal* , 4(1).
- Zhuang, S. (2024). E-commerce consumer privacy protection and immersive business experience simulation based on intrusion detection algorithms. *Entertainment Computing*, 51, 100747. <https://doi.org/10.1016/j.entcom.2024.100747>