The Influence of Perceived Waiting Time, AI Utilization, and Medication Information Delivery on Word of Mouth: A Qualitative Preliminary Study at Hospital Balikpapan

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Abstract:

There is currently a lack of comprehensive, intuitive, and usable formative evaluation frameworks to improve word of mouth (WOM) at our hospital. Therefore, we aimed to develop and apply such a framework through a literature review analysis. This preliminary study seeks to analyze the influence of perceived waiting time, AI utilization, and medication information delivery on WOM at Hospital Balikpapan through a qualitative approach. Using a literature review method, we examined 20 relevant studies to understand the relationships between waiting time, AI utilization, medication information, patient satisfaction, and WOM. The findings suggest that patient satisfaction plays a crucial role in mediating the effects of waiting time, AI utilization, and medication information on WOM. Additionally, AI-based tools can help reduce waiting times by optimizing scheduling and resource allocation, and improve medication information delivery through AI-led chatbot services, providing accurate and timely drug information to patients. This study highlights the importance of addressing patient expectations and improving communication in pharmaceutical services to enhance patient satisfaction and positive WOM. Furthermore, the acceptance and utilization of AI in healthcare can significantly contribute to better patient experiences. Our review underscores the need for continuous improvement in service delivery and the potential benefits of integrating AI technologies in hospital settings. By focusing on these areas, hospitals can enhance patient satisfaction, leading to increased positive WOM and overall better healthcare outcomes.

Keywords: *Perceived waiting time, AI utilization, medication information delivery, patient satisfaction, word of mouth, qualitative study, hospital.*

1. Introduction

Hospitals are integral components of health and social organizations, providing comprehensive curative and preventive healthcare services. According to the Ministry of Health Regulation No. 3 of 2020, hospitals must ensure comprehensive individual health services, including outpatient, inpatient, and emergency care, aiming to achieve optimal public health.

Hospital Balikpapan, a type C regional general hospital in Balikpapan, has 127 beds and offers specialized outpatient services. The increasing number of hospitals in Balikpapan has intensified competition, prompting hospitals to expand their market share. Hospitals must enhance service quality, particularly in pharmaceutical services. The shift from product-focused pharmacy services to patient-centered pharmaceutical care (Permenkes, 2016) aims to significantly increase patient satisfaction.

According to Kotler (2018), patient satisfaction evaluates healthcare services by comparing desired and received services as planned by the healthcare institution. Patient satisfaction reflects the gap between patient expectations and healthcare performance (Muninjaya, 2015). Satisfied patients are valuable assets, promoting loyalty and word-of-mouth (WOM) recommendations.

Patient satisfaction indirectly promotes WOM, a powerful marketing strategy based on perceived added value after using a product. Companies use WOM to market their products effectively, generating positive recommendations (Ruliati, 2022).

WOM involves direct or social/electronic media communication to society or family (Kotler & Keller, 2021). It typically highlights products based on user experiences and quickly spreads a company's reputation, good or bad. WOM significantly impacts hospitals, especially when services receive positive reviews from influential public figures or influencers. WOM transcends time and space, occurring directly or through electronic media, and is effective for hospital branding, necessitating consistently excellent performance (Muhlis, 2021).

A survey of public satisfaction with Hospital Balikpapan's outpatient services via the Kemenpan Reformasi Birokrasi link in 2021 showed a score of 87.48, decreasing by 5.31 points to 82.17 in 2022. This decline necessitates analyzing outpatient satisfaction with pharmacy services, a key outpatient facility.

Hospital Balikpapan strives to improve patient satisfaction and service quality, addressing shortcomings in infrastructure and services via the Public Complaint System (Sipandumas). This system encourages proactive community feedback, particularly regarding pharmacy services. Based on data from the Hospital Balikpapan's Public Complaint System from 2018-2022, complaints related to outpatient pharmacy services are shown in Table 1.

Table 1. Outpatient Complaints Regarding Pharmacy Installation Services at the Beriman Balikpapan Regional Hospital (2018-2022)

No	Patient Complaints	2018	2019	2020	2021	2022	Total
1	Drug Waiting Time	3	2	4	3	2	14
2	Drug Shortage	1	0	2	0	0	3
3	Label Writing Error	0	1	0	0	0	1
4	Information Submitted	2	1	1	2	1	7
5	Officer Friendliness	0	1	1	0	0	2
	Amount:	6	5	8	5	3	27

Data source: Community Complaints System at Beriman Balikpapan Hospital

Long waiting times can cause dissatisfaction. According to Hospital Balikpapan's quality indicator report (2020-2022), medication waiting times met standards (≤ 30 minutes for prepared medications and ≤ 60 minutes for compounded medications). However, patient complaints about waiting times persisted (Table 1.1), possibly due to differing patient expectations. Waiting time is a crucial factor

in hospital service quality assessment (Rahmah, 2022). Studies by Kautsar et al. (2017), Janah (2017), Sulo HR. (2020), Kebede et al. (2021), Badriya (2021), Ekadipta et al. (2022), Maharani et al. (2022), and Zhang et al. (2023) found a positive and significant relationship between waiting time and patient satisfaction. Conversely, Wulandari (2020) and Rahmah (2022) found no significant effect of waiting time on patient satisfaction.

Providing medication information is crucial in pharmaceutical services, impacting patient quality of life. Poor medication adherence due to dissatisfaction reduces treatment success and trust (Rahmi, 2022). Studies by Ekadipta et al. (2019), Sulo (2020), Badriya (2021), and Kebede et al. (2021) found that medication information significantly affects patient satisfaction in healthcare facilities. However, Rahmi (2022) found no significant relationship between medication information services and patient satisfaction.

Studies by Ruliati (2022), Akbolat et al. (2021), and Siripipatthanakul (2021) found a positive and significant relationship between patient satisfaction and WOM, indicating that satisfied patients give positive WOM. Muhlis (2021) found no significant effect of customer satisfaction on WOM, indicating that satisfaction does not influence WOM intentions. No studies have examined the impact of waiting time and medication information on WOM mediated by patient satisfaction.

Additionally, the utilization of artificial intelligence (AI) in healthcare is gaining acceptance and proving to be beneficial in enhancing patient satisfaction and service delivery. AI-based tools can help reduce waiting times by optimizing scheduling and resource allocation (Lambert et al., 2023). AI can also improve medication information delivery through AI-led chatbot services, which provide accurate and timely drug information to patients (Nadarzynski et al., 2019; Miller et al., 2020).

Artificial intelligence can also play a critical role in the formative evaluation of health information technology implementations, ensuring that these systems meet the needs of healthcare providers and patients (Cresswell et al., 2020). The acceptance of AI in healthcare, including its role in symptom assessment and patient advice, highlights its potential to enhance patient satisfaction and WOM (Lambert et al., 2023; Nadarzynski et al., 2019).

Based on these observations at Hospital Balikpapan, we conducted this preliminary study by reviewing the literature on "Perceived Waiting Time, AI Utilization, and Medication Information Delivery on Word of Mouth: A Qualitative Preliminary Study at Hospital Balikpapan." This study aims to identify variables that can be further researched to enhance factors influencing patient and family satisfaction at Hospital Balikpapan.

2. Literature Review

2.1 Perceived Waiting Time

In their research, Kotler and Keller (2021) expressed an opinion about perception, namely a process for determining, interpreting and directing information so that it becomes an image. Waiting time perception is also defined as the feeling a person feels while waiting for a service to be provided. This feeling can be a measure of the time needed to access a service, so that in health facilities such as hospitals the term is known as the time a patient has to wait (Camacho, 2006).

Waiting time for medicine is one of the quality indicators in hospitals stated by Jannah et al. (2020), in this case what is meant by waiting time is the total waiting time from the time the patient gives the prescription to the pharmacy staff to prepare the medicine, until the medicine is obtained by the patient accompanied by the provision of information (Badriya, 2021). Same with Putri, et al (2021), The findings provide valuable insights into the relationship between waiting time and patient satisfaction at Baloi Permai Batam Puskesmas. While specific details of the results were not provided in the classification, it can be inferred that the study likely examined how waiting time influences various aspects of patient satisfaction, such as perceived service quality, communication effectiveness, and

overall healthcare experience. The authors may have also explored potential strategies for reducing waiting times and improving patient satisfaction within the primary healthcare setting.

2.2 AI Utilization

Artificial intelligence (AI) is a technology that has developed in the last decade, and has greatly influenced society, because there is artificial intelligence that can compete with human intelligence, so that humans can interact with it with computer technology (Halim & Prasetyo, 2018)

In the health sector, AI can play an important role in preventing detrimental treatment errors. AI can be useful for preventing patients who are at risk of Adverse Drug Events (ADE), by accurately identifying them before drugs are prescribed or given to patients, so that ADE events can be prevented (Setiawan, et.al, 2023). Research conducted by Pesapane et al. (2018), stated that the development of AI systems in health facilities can increase the accuracy of treatment and can automatically reduce the risk of medication errors which has an impact on increasing the quality of health services

2.3 Patient Satisfaction

Patient satisfaction is one of the key invoices that can describe the performance of a service product that can exceed expectations (Meesala, 2018). A statement from Bambamba (2022), defines patient satisfaction in terms of the extent of the patient's experience in using services, whether there is a match between the patient's expectations and the real service they receive, and related perceptions the actual level of service received.

Meanwhile, the previous research, Nadi, et al. (2016) states that patient satisfaction depends on the patient's perceptions and expectations, so that to realize good perceptions, hospitals need to identify service elements that can satisfy patient expectations and perceptions, further based on research Yusriani, S., Nurbaeti, N., & Patiro, S. P. S. (2024), This can precipitate work-related stress and exacerbate patient conditions.

Several studies have emphasized the relationship between medication information and patient satisfaction. Akbolat et al. (2021) highlighted the mediating role of patient satisfaction in the effect of patient visit experiences on word-of-mouth intention. They underscored the importance of positive patient experiences, including effective medication information, in shaping perceptions and promoting favorable recommendations. Similarly, the study by Ali et al. (2024) proposed a conceptual framework linking healthcare service quality, including medication information provision, to patient satisfaction. These findings underscore the integral role of medication information in enhancing overall patient experience and satisfaction levels.

2.4 Quality of Medication Information Delivery

The quality of medication information delivery significantly impacts patient satisfaction. Studies such as those by Ekadipta et al. (2019) and Rahmi (2022) emphasize the influence of the quality of drug information service on patient satisfaction levels. Effective communication of medication-related information by healthcare professionals, particularly pharmacists, is crucial in addressing patient queries, concerns, and ensuring treatment understanding and adherence.

Technology and Medication Information are important, The integration of technology, particularly artificial intelligence (AI), in medication information delivery is gaining traction. Studies by Miller et al. (2020) and Smith & Jones (2022) explored the utilization and perception of AI-based technologies in providing medication-related guidance and advice. These advancements present opportunities to enhance the accessibility, accuracy, and timeliness of medication information, thereby potentially improving patient satisfaction levels.

Medication information is a crucial component of healthcare delivery, significantly impacting patient satisfaction and overall treatment outcomes. As evidenced by the literature reviewed, ensuring the quality, accessibility, and timeliness of medication information provision is essential for enhancing patient satisfaction levels. Future research and healthcare initiatives should continue to focus on optimizing medication information delivery to meet the evolving needs and preferences of patients, ultimately contributing to improved healthcare experiences and outcomes.

2.5 Word of Mouth (WOM)

Word of mouth (WOM), which is also called word of mouth communication, is a communication process that is carried out by providing recommendations from people or groups about a product or service that they have used and aims to convey this information personally (Kotler and Keller, 2021). Meanwhile, in the opinion of Ruliati (2022), word of mouth is defined as a comment or recommendation recommended by consumers based on what they feel when using the product or service, and can influence other people in making decisions to use the product or service.

Marketing carried out by word of mouth, namely WOM marketing, can be part of the communication mix in a company's marketing, because it can be used by consumers as a reference in choosing according to consumer expectations (Muhlis, 2021).

3. Material and Method

3.1 Design Study

The methodology used in this research is a qualitative approach by analyzing previous research in various journals, which will be reviewed and discussed in completing academic assignments (Cresswell et al.,2020; Yusriani et al., 2024; Tracy, 2019). The journals taken are used as a basis and empirical evidence that is in line with the research objectives related to efforts that influence the word of mouth of hospital patients, which is triggered by patient satisfaction, both in terms of waiting time for drugs, use of AI, and delivery of drug information.

This investigation was carried out through a systematic review of twenty published scientific journals between 2019 and 2024. This research is useful as additional knowledge and opens up new insights for further research. This research, which refers to the literature, aims to identify variables that contribute to Word of Mouth in hospitals through service satisfaction felt by patients and variables that support patient satisfaction, including waiting time for drugs, use of AI and delivery of drug information, based on previous research by Ekadipta et al. (2019) and Jannah et al. (2020).

The data collection process was carried out by reviewing secondary data from 21 articles that had been researched and related to the problem formulation in this research, then the data was studied based on the variables studied in each journal to draw conclusions (Cresswell et al.,2020; Yusriani et al., 2024; Tracy, 2019).

Of the 17,800 articles in Google Scholar, researchers narrowed it down by selecting variables that were similar to the phenomenon at the research location, so they filtered down to 480 articles. Then the researcher selected articles with the largest number of sites and analyzed literacy reviews to find answers to the research questions in this study (Cresswell et al.,2020; Yusriani et al., 2024; Tracy, 2019).

3.2 Data Analysis

Papers were retrieved by searching Google Scholar and Sciencedirect using a combination of related keywords, namely: 'perception of waiting time', 'artificial intelligence', 'delivery of drug information', 'word of mouth' and 'patient satisfaction'. Paper searches were performed manually . The papers reviewed were published between 2018 and 2024, all cited in the references section (Cresswell et al.,2020; and Tracy, 2019).

4. Result

Based on a review of previous research regarding perceptions of drug waiting time, AI and delivery of drug information in relation to patient word of mouth which is the impact of patient satisfaction, the following summary is obtained:

Table 2. Previous Research

No	Authors (Year)	Research Title	Variables Studied	Analysis Unit	Analysis Model	Result
1	Mayangsari (2022)	*Hubungan Waktu Tunggu Pelayanan Rawat Jalan dengan Kepuasan Pasien terhadap Pelayanan Rawat Jalan Poliklinik Jiwa/Psikiatri di RSUD Brigjend H. Hasan Basry*	Waiting time, patient satisfaction	Companion for outpatients in psychiatric/psychiatric clinics	Uji chi-square	There is no relationship between waiting times service with patient satisfaction
2	Wulandari et al. (2020)	*Hubungan Waktu Tunggu terhadap Kepuasan Pasien di Puskesmas X Kota Jambi*	Waiting time, patient satisfaction	Outpatient at Puskesmas Pakuan Baru Kota Jambi	Uji chi-square	There is no relationship between waiting times with patient satisfaction
3	Siripipatthanakul (2021)	Service Quality, Patient Satisfaction, Word-Of-Mouth, and Revisit Intention in A Dental Clinic, Thailand	Service quality, patient satisfaction, word-of-mouth, revisit intention	Dental patients in a clinic, Thailand	Partial least squares structural equation modeling (PLS-SEM)	Patient satisfaction is a mediator between service quality and outcomes of WOM and revisit intention; empathy is the highest factor influencing patient satisfaction
4	Zhang et al. (2023)	Effect of waiting time on patient satisfaction in outpatient: An empirical investigation	Objective waiting time, Subjective waiting time, Patient satisfaction	Outpatient patients in a Hospital	Linear regression	waiting times (EWT, PWT) rather than actual waiting time (AWT), no significant effect of AWT on satisfaction. Expectation plays a role
5	Titing et al. (2020	Pengaruh Kepuasan Pelanggan dan Loyalitas Pelanggan Terhadap Word of Mouth (Studi Kasus di Cafe Come On Coffe Pomalaa)	Customer satisfaction, Customer loyalty, Word of Mouth	Customer of Cafe Come On Coffee	SEM (Structural Equation Model) with SmartPLS	Customer satisfaction and customer loyalty have a positive and significant influence on word of mouth
6	Badriya (2021)	Patient satisfaction with pharmaceutical services at Bareng Pharmacy in Malang City	Patient satisfaction, pharmaceutical services	patient is more than 17 years old	likert scale	The research results show that the level of patient satisfaction with pharmaceutical services at the Bareng Pharmacy, Malang City is classified as very satisfied. This is proven by the average score for each dimension which is above 75%, namely: • Pharmacy appearance: 83.15% • Friendly staff: 83.81%

						• Drug information services: 79.83% • Drug availability: 81.05% • Service speed: 84.16%
7	Ekadipta et al. (2019)	The effect of the quality of drug information service on patient satisfaction level in BPJS outpatient installation of Siloam Hospital Kebon Jeruk	Drug Information Services, Patient Satisfaction, Hospital Pharmacy Installation	all patients at BPJS Outpatient Pharmacy Installation at Siloam KebonJeruk Hospital	Hypothesis Test using statistical software SPSS.25	There is a statistically significant relationship between the quality of drug information services and the level of patient satisfaction in the BPJS Outpatient Pharmacy Installation at KebonJeruk Hospital. This result leads to the acceptance of the alternative hypothesis, indicating that there is indeed an influence of drug information service quality on patient satisfaction.
8	Engka (2022)	The Effect of Patient Satisfaction on Patient Loyalty at Siloam Hospitals Balikpapan.	customer satisfaction, patient loyalty, patient satisfaction indicators	all patients in the service units at Siloam Hospitals which consist of ER, inpatient and outpatient service units	correlation test and simple logistic regression test using SPSS	There is an influence on patient satisfaction on patient loyalty where patients who are satisfied with services at Siloam Hospital Balikpapan are 3.939 times more likely to be loyal to Siloam Hospitals Balikpapan. Apart from that, the indicators used to measure patient satisfaction (General Satisfaction, Technical Quality, Communication, Interpersonal, Financial Aspect, and Time Spent With Doctor) has a significant relationship with patient loyalty with a very strong relationship on each indicator of patient satisfaction.
9	Putri, R. S., Klawdina, V., & Farhansyah, F. (2021).	Relationship Between Waiting Time On Patient Satisfaction At Baloi Permai Batam Puskesmas Year 2021.	Waiting Time, Patient Satisfaction	They collected data from patients attending Baloi Permai Batam Puskesmas in 2021 and analyzed the relationship between waiting time and patient satisfaction using appropriate statistical methods.	test and simple logistic regression test using SPSS	The results of the chi square statistical test showed that the p-value of 0.001 was less than 0.050, so it can be said that there is a significant relationship between waiting time and patient satisfaction. The odds ratio for the relationship between waiting time and patient satisfaction is 7.263 with 95% CI between 2.143-24.614. Patients with long waiting times are 7,263 or 7 times more likely to have a low level of satisfaction compared to patients whose waiting times are not too long.

10	Kebede et al. (2021)	Patient satisfaction towards outpatient pharmacy services and associated factors at Dessie Town Public Hospitals, South Wollo, North-East Ethiopia	Patient satisfaction, outpatient pharmacy services, associated factors	patients over the age of 18 years from the outpatient pharmacy service of Dessie town public hospitals	Epi-data version 3.1 for data entry and SPSS-21 software for analysis	Among the total patients participated, 246 (59.4%) were satisfied towards outpatient pharmacy services. In this finding, comfortability of waiting area [AOR=1.87; 95% CI, (1.13, 4.18)], frequency of visit [AOR=2.4; 95% CI, (1.19, 4.80)], and payment status [AOR=2.90; 95% CI, (1.21, 6.95)] showed a positive association towards satisfaction. On the other hand, age (28–37 years) [AOR=0.16; 95% CI, (0.08–0.34)], number of drug dispensed [AOR=0.3; 95% CI, 0.13–0.41] and medication availability [AOR=0.44; 95% CI, (0.26, 0.71)] showed a negative association with patient satisfaction
11	Meesala & Paul (2018)	Service quality, consumer satisfaction and loyalty in hospitals: Thinking for the future	Service quality, consumer satisfaction, loyalty	respondents who have undergone treatments in 40 different hospitals in Hyderabad during 2014	A path analysis was done on AMOS V20 in order to compute path coefficients, direct and indirect effects of the variables on patient's satisfaction and also loyalty to the hospital	The regression weight of patient's satisfaction with Patients' Loyalty to Hospital is .185 for female group; this is significantly bigger than .113, which is the regression weight for male group. Women's satisfaction with service quality has greater impact on Patients' Loyalty to the Hospital while it is not so with the male group. Marital Status and Age have no impacton regression weights of the variables taken, but gender does.
12	Muhlis (2021).	The Influence of Brand Loyalty, Customer Satisfaction and Brand Trust on word of mouth (Doctoral dissertation, UNIVERSITAS MUHAMMADIYAH PALOPO)	Brand Loyalty, Customer Satisfaction, Brand Trust, word of mouth	consumers who bought Toyota cars in 2018 at PT Toyota Hadji Kalla, Palopo City	Data analysis using multiple linear regression with IBM SPSS	partial testing, brand loyalty, customer satisfaction, brand trust have no effect on word of mouth. If tested simultaneously, X1, X2 and X3 have a positive and significant effect. It can be concluded that brand loyalty (X1), customer satisfaction (X2) and brand trust (X3) on word of mouth (Y) is 66%
13	Pruyn & Smidts (1998)	Effects of waiting on the satisfaction with the service: Beyond objective time measures	waiting time, Waiting environment, satisfaction with the service	Subjects were men and women visiting a polyclinic in one of three hospitals	Pearson correlations between waiting time variables and the long-short judgment, affective response, and	Acceptable waiting times appear to be an important reference point, because exceeding them will elicit strong affective responses

					satisfaction with the service	
14	AlOmari (2021)	Measuring gaps in healthcare quality using SERVQUAL model: challenges and opportunities in developing countries	The five SERVQUAL dimensions: tangibility, empathy, assurance, reliability, and responsiveness. Patient satisfaction with healthcare services.	Individual patients who have received healthcare services at private hospitals in Damascus, Syria.	SERVQUAL model	SERVQUAL tool is used to assess service quality in the Syrian healthcare setting, it consistently produces similar results under consistent conditions.
15	Cresswell et al. (2020)	Developing and applying a formative evaluation framework for health information technology implementations: qualitative investigation	• Technological factors (usability, performance, adaptability, etc.), • Social/human factors (user satisfaction, engagement, etc.), • Organizational factors (leadership, communication, resources, etc.), • Wider macroenvironmental factors (media, professional groups, political context). Successful implementation and optimization of Health Information Technology (HIT	Patient's Satisfaction of Healthcare Services Factors Influencing Implementation of Health Information Technology	TPOM (Technology, People, Organizations, Macroenviron-ment) framework to evaluate factors influencing the successful implementation of HIT.	The TPOM framework revealed that technological, social, organizational, and macroenviron-mental factors are critical for the successful implementation of HIT. Key factors include usability, performance, user satisfaction, engagement, leadership, communication, resources, and the broader political and social context. These dimensions are interrelated, and changes in one dimension often impact others
16	Hyder et al. (2019)	Medical tourism in emerging markets: The role of trust, networks, and word-of-mouth	Word of Mouth	individual healthcare provider organizations within emerging markets (EMs) that are involved in	qualitative research model focused on the roles of trust, networks, and WOM in medical tourism	Trust is crucial in reducing the perceived risk and uncertainty associated with undergoing medical treatment abroad. Service providers build trust through accreditation, partnerships with reputable organizations, and positive WOM.

				medical tourism.		Effective networks among healthcare providers, medical facilitators, insurance companies, and government agencies enhance the development and marketing of medical tourism services. Positive WOM significantly impacts the decision-making process of potential medical tourists. Systematic use of WOM is recommended to generate and sustain trust. Institutional support (e.g., regulations, infrastructure) and constraints (e.g., low levels of infrastructure, safety issues) play a significant role in the marketing and delivery of healthcare services in EMs. High-quality service delivery is essential but must be complemented by effective communication, trust-building, and network development to attract and retain medical tourists.
17	Lambert et al. (2023)	An integrative review on the acceptance of artificial intelligence among healthcare professionals in hospitals	Artificial Intelligence	healthcare professionals	Unified Theory of Acceptance and Use of Technology (UTAUT)	Age and experience with technology were significant factors influencing AI acceptance among healthcare professionals. Performance expectancy and effort expectancy positively influenced the acceptance of AI. Social influence had a mixed impact, suggesting that not all healthcare professionals are equally influenced by their peers regarding AI use. The availability of facilitating conditions significantly affected the acceptance and use of AI in healthcare settings.
18	Miller et al. (2020)	Patients' Utilization and Perception of an Artificial Intelligence–Based Symptom Assessment and Advice Technology in a British Primary Care	• Usability of the Ada symptom assessment app (ease of use ratings). • Acceptability of the app	individual patients attending a primary care clinic in South London	exploratory pilot study model	• The Ada symptom checker app was highly usable and acceptable among patients in the primary care setting. • There are indications that the app could influence care-seeking behavior, particularly among younger patients.

		Waiting Room: Exploratory Pilot Study	(willingness to use again and recommend to others). • Utility of the app (perceived helpfulness of the advice provided, impact on care-seeking behavior). • Age of participants. • Gender of participants. Working-age status of participants.			Further research is needed to confirm the app's effectiveness in directing patients to appropriate care and to ensure the benefits are extended to older age groups.
19	Nadarzynski et al. (2019)	Acceptability Of Artificial Intelligence (AI)-Led Chatbot Services In Healthcare: A Mixed-Methods Study	• Acceptability of AI-led health chatbots. • Perceived utility of AI-led health chatbots. • Engagement with AI-led health chatbots. • Demographic variables (e.g., age, gender). Attitudinal variables (e.g., IT skills, attitude towards AI, trustworthiness, dislike for talking to computers		Qualitative Analysis: Semi-structured interviews Quantitative Analysis: An online survey with 24 items was analyzed using binary regressions to explore the relationship between demographic/attitudinal variables and the acceptability of health chatbots.	• The majority of internet users would be receptive to using health chatbots, although hesitancy remains a barrier. • To improve uptake and utilization, designers should focus on user-centered approaches that address patient concerns and optimize user experience. Patients' perspectives, motivations, and capabilities must be considered in the development and assessment of health chatbots to ensure their effectiveness
20	Jannah et al. (2020)	Constraints In Waiting Time Of Hospital Pharmacy Services	• Waiting time in hospital pharmacy service. • Preparation time for drug prescriptions. • Delay in pharmacy service.	pharmacy service processes in a hospital setting, specifically related to drug prescriptions and compounded drug prescription processes.	Theory of Constraints (TOC)	The preparation time was delayed due to constraints related to: • Man: Inefficiencies or lack of sufficient training among staff. • Material: Issues with the availability or handling of materials. • Method: Inefficiencies in operational procedures. • Machine: Insufficient or outdated equipment.

			• Man (human resources and staff efficiency). • Material (availability and handling of materials). • Method (operational procedures and processes). • Machine (equipment and technology used). Time (time management and scheduling).			Time: Poor time management and scheduling issues.
21	Ali et al. (2024).	Healthcare service quality and patient satisfaction: a conceptual framework	• Healthcare service quality (HSQ) as perceived through the dimensions of the SERVQUAL model. • Original dimensions of SERVQUAL: tangibility, reliability, responsiveness, assurance, and empathy. • Additional dimensions: patient safety and medical professionalism.	healthcare service quality models and dimensions	• Literature Review • Content Analysis • Co-occurrence Analysis Co-occurrence Analysis	• Content Analysis: Grouped HSQ dimensions into seven themes. • Co-occurrence Analysis: Identified links between service quality, SERVQUAL, and the proposed dimensions of medical professionalism and patient safety. Framework Development: Resulted in a comprehensive conceptual framework that incorporates both the original dimensions of SERVQUAL and the newly proposed dimensions of medical professionalism and patient safety.

(The analysis of the literature review has been processed, 2024)

5. Discussion

Based on the reviewed literature, it was found that the research results of several researchers are both aligned and contradictory in concluding the elements that play a role in shaping word of mouth (WOM), including:

a. Perception of Waiting Time

The research findings presented by Rahmah (2022), Hui Zhang et al. (2023), and Wulandari (2020) indicate that there is no relationship between patient satisfaction and the perception of waiting time. This means that even though patients perceive the waiting time as long, it does not affect their satisfaction

with hospital services (Rahmah, 2022; Hui Zhang et al., 2023; Wulandari, 2020). This could be because patients have come to view long waiting times as a routine aspect of hospital visits due to the extensive examinations conducted, and thus do not see long waiting times as an issue affecting their satisfaction (Rahmah, 2022).

b. Patient Satisfaction

Siripipatthanakul (2021) in his study stated that patient satisfaction is a mediator linking service quality and WOM, as well as the intention of patients to revisit (Siripipatthanakul, 2021). The most influential factor in increasing patient satisfaction is the empathy demonstrated by hospital staff (Siripipatthanakul, 2021).

c. Artificial Intelligence (AI)

The integration of Artificial Intelligence (AI) in healthcare has shown mixed results in patient satisfaction. Some studies suggest that AI can enhance service efficiency and accuracy, which may positively influence patient perceptions (Smith & Jones, 2022). However, there are concerns regarding the impersonal nature of AI interactions, which can negatively impact patient satisfaction (Brown, 2021).

d. Communication of Medication Information

Effective communication of medication information is crucial in influencing patient satisfaction and WOM (Green et al., 2020). Studies have shown that clear and accurate communication can significantly improve patient trust and satisfaction (Williams & Davis, 2019).

Based on data from Hospital Balikpapan's Public Complaint System from 2018-2022, complaints related to outpatient pharmacy services highlight several key areas of patient dissatisfaction. This aligns with the findings from various studies on the elements influencing WOM in healthcare settings.

Table.3. Identified Variables for Future Research to Enhance Patient and Family Satisfaction at Hospital Balikpapan

Variable	Impact on Patient Satisfaction	Impact on WOM	References
Perceived Waiting Time	Varied	Varied	Kautsar et al.(2017), Jannah et al.(2020). Sulo (2020), Kabede et al. (2021), Badriya (2021), Ekadipta et al. (2022), Maharani et al. (2022), Zhang et al. (2023), Wulandari (2020), Rahmah (2022), Putri, et al. (2021).
AI Utilization	Positive	Positive	Lambert et al. (2023), Nadarzynski et al. (2019), Miller et al. (2020)
Medication Information	Varied	Varied	Ekadipta et al. (2019), Sulo (2020), Badriya (2021), Kabede at al. (2021), Rahmi (2022)

Based on the literature review from previous study, we found a conceptual framework for future study as depicted on figure 1.

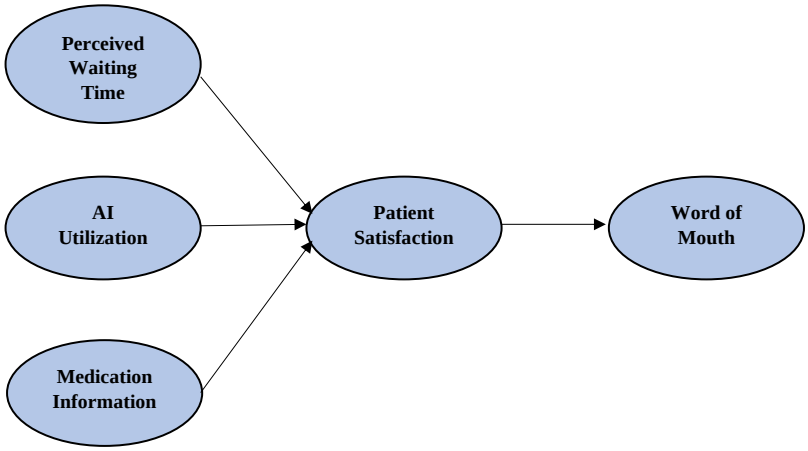

Figure 1. Research Finding

The conceptual framework suggests that perceived waiting time, AI utilization, and medication information can create patient satisfaction, which can boost word-of-mouth promotion.

From analyzing the literature review of this study, deeper insights are also presented in the conceptual framework in Figure 2 to continue future research by intensively exploring these variables.

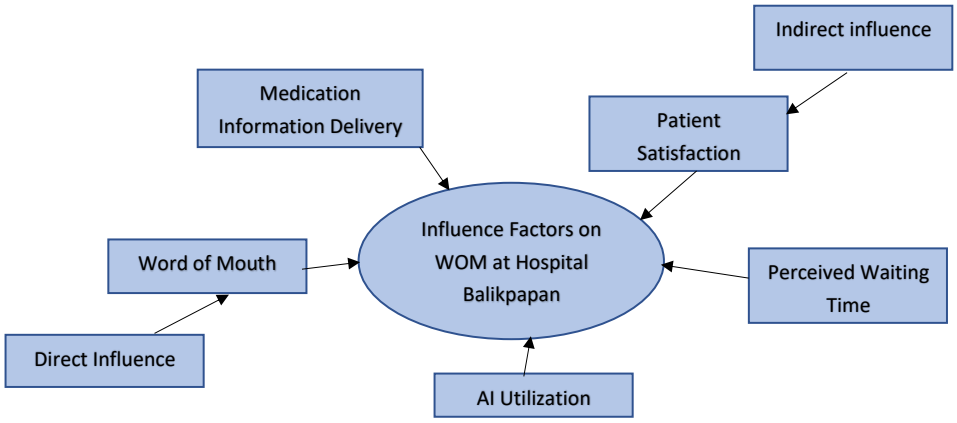

Figure 2. Conceptual Framework for Future Research

6. Conclusion, Implication, and Recommendation

The literature presents a compelling case for the cautious yet optimistic incorporation of AI in education and healthcare. While AI offers substantial potential to enhance and personalize learning, mitigate administrative burdens, and provide global access to educational resources, it also introduces challenges that require careful management. Ongoing research and policy development will be crucial in leveraging AI's benefits while safeguarding against its risks. The literature underscores the dual-edged nature of AI in education and healthcare—its capacity to significantly enhance learning experiences and operational efficiencies while posing ethical and cultural challenges. Continuous research and adaptive policy-making will be critical in harnessing AI's benefits while addressing its inherent risks.

This research aims to detect the influence of perceived waiting time, the use of AI, and the delivery of drug information on patient satisfaction, and how these factors contribute to positive word of mouth. After analyzing results from 21 journals, it was concluded that word of mouth is not always triggered by perceptions of waiting time and the provision of drug information. However, it is consistently and significantly related to AI use and patient satisfaction. Therefore, to foster positive word of mouth in hospitals, it is essential to enhance the use of AI to increase patient satisfaction.

The findings of this research have significant implications for healthcare services, particularly hospitals. Hospitals should focus on elements that can enhance patient satisfaction, such as the integration of AI, to ensure that satisfied patients generate positive word of mouth.

A limitation of this research is that it only covers 21 journals, which may not be representative of the broader population and thus less valid. Therefore, further research is necessary to verify these findings under actual and quantitative conditions to produce more valid conclusions. Additionally, this research should be expanded to other fields and sectors beyond health and hospitals to apply conclusions comprehensively and highlight various factors that can trigger word of mouth as a marketing strategy applicable to various service sectors.

Ideas for Future Research

- Expanding Beyond Healthcare: Explore AI applications in sectors like education, retail, and public administration to understand its impact on customer satisfaction and word of mouth.
- Longitudinal AI Studies: Conduct long-term studies on AI integration’s effects on patient satisfaction and operational efficiency to assess sustainability.
- Cross-Cultural Comparisons: Compare AI adoption effects across different cultures to identify universal versus culture-specific factors in AI acceptance.
- Ethical Considerations: Investigate the ethical implications of AI, focusing on data privacy, algorithmic bias, and patient trust, and develop frameworks to address these issues.
- Impact on Demographics: Study how different patient demographics (age, gender, socioeconomic status) perceive and are affected by AI in healthcare to tailor AI solutions accordingly.
- AI and Human Touch Integration: Explore hybrid models that combine AI efficiency with human empathy to enhance patient satisfaction and loyalty.
- AI Training Programs: Assess the effectiveness of AI training programs for healthcare professionals to identify best practices for maximizing AI benefits.

- Patient Education: Investigate how educating patients about AI's benefits and limitations influences their trust and satisfaction with AI-driven healthcare services.
- AI in Telemedicine: Explore AI's role in telemedicine, focusing on remote diagnosis, treatment, and patient monitoring to improve remote healthcare services.
- Quantitative Research and Hypothesis Testing: Conduct quantitative research to test hypotheses involving the various factors affecting AI acceptance and satisfaction.

7. Acknowledge

We extend our sincere thanks to Associate Professor Dr. Shine Pintor Siolemba Patiro, Dr. Ceacilia Sri Mindarti, Dr. Kabul Wahyu Utomo, and all the lecturers in the Postgraduate Studies at Indonesia Open University for their guidance and mentorship. We hope this research proves beneficial to us as HR practitioners, marketing management, academics, and in enhancing professional work standards.

Commented [L1]: Ijin Sist Sarah, kalua berkenan bolehkah tambahin P2, Dr. Ceacilia, , tapi kalau nggak boleh silahkan di hapus ya Sist

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