

The Impact of Waiting Time and Education Level on Outpatient Satisfaction: Meta-Analysis

Stefani Clara Alverina¹⁾, Noor Alis Setiyadi²⁾, Eti Poncorini Pamungkasari³⁾

¹⁾Masters Program in Public Health, Universitas Sebelas Maret, Surakarta, Indonesia

²⁾Faculty of Health Sciences, Universitas Muhammadiyah Surakarta, Surakarta, Indonesia

³⁾Faculty of Medicine, Universitas Sebelas Maret, Surakarta, Indonesia

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ABSTRACT

Background: Patient satisfaction is a primary focus in the delivery of health care services. Assessment of patient satisfaction has been widely conducted worldwide and serves as an important tool for identifying service gaps and developing effective strategies to improve quality within the health care industry. Various factors influence patient satisfaction, including waiting time and educational level. This study aimed to analyze the effects of waiting time and educational level on outpatient satisfaction.

Subjects and Method: This study employed a systematic review and meta-analysis using the PICO framework. The population consisted of outpatient clinic patients. The interventions were long waiting times and higher educational levels. The comparisons were short waiting time and lower educational level. The outcome was patient satisfaction. Data were obtained from Google Scholar, ScienceDirect, Elsevier, SpringerLink, Wiley, Scopus, and PubMed databases, covering publications from 2018 to 2023. The keywords used were “patient satisfaction” AND “waiting time” AND “short waiting time” AND “long waiting time” AND “educational level” AND “outpatient department”. A total of 13 articles met the inclusion criteria, which were full-text articles using a cross-sectional design, outpatient subjects, and reporting outcomes in the form of odds ratios. Article selection followed the PRISMA flowchart, and data analysis was performed using Review Manager version 5.4.

Results: The 13 included studies involved a total of 25,017 participants from Ethiopia, Fiji, Pakistan, South Africa, and Serbia. The pooled analysis showed that patients experiencing long waiting times had 0.18 times lower satisfaction compared to those with short waiting times (aOR = 0.18; 95% CI= 0.06 to 0.49; p <0.001). In addition, patients with higher educational levels had 1.02 times higher satisfaction compared to those with lower educational levels, although this association was not statistically significant (aOR = 1.02; 95% CI= 0.34 to 3.02; p = 0.980).

Conclusion: Shorter waiting times are associated with higher patient satisfaction in outpatient clinics. Higher educational level shows a positive but non-significant association with patient satisfaction.

Keywords: patient satisfaction, waiting times, health care utility, health care quality

Correspondence:

Stefani Clara Alverina, Masters Program in Public Health, Universitas Sebelas Maret. Jl. Ir. Sutami 36A, Surakarta 57126, Central Java, Indonesia. Email: clrstefani98@gmail.com.

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BACKGROUND

Health care delivery systems have evolved substantially over time, shifting from the traditional concept of health care as a noble profession to a service industry with a strong customer-oriented focus. This transition has introduced new challenges for health care organizations in delivering high-quality services that are safe, timely, efficient, evidence-based, and patient-centered (Chandra et al., 2019). As patients are the central focus of health service provision, it is essential to conduct evaluations that assess whether the health care services provided meet patient expectations and whether patients are satisfied with the care they receive.

Assessment of patient satisfaction has been widely conducted worldwide and serves as an important tool for identifying service gaps and developing effective strategies to improve quality within the health care industry (Chandra et al., 2019). Patient satisfaction is defined as the extent to which the health care services provided meet patients' expectations (Thanh et al., 2022). It is a complex process influenced by various factors, including patients' sociodemographic characteristics, previous experiences with health care services, and individual expectations. Therefore, understanding the determinants of patient satisfaction is crucial for the provision of high quality health care services (Ayele et al., 2020).

Current theoretical models of patient satisfaction conceptualize satisfaction with health care services as a combination of intrinsic patient factors, expectations, and subjectively perceived outcomes. Patient satisfaction may be influenced by several factors, such as sociodemographic characteristics including age, sex, educational level, and marital status, as well as patient expectations, health status, waiting time, service costs, and availability of treatment (Alanazi et al., 2023). One

key factor that may enhance patient satisfaction is service responsiveness, particularly the duration of service delivery or the ability of health care providers to deliver services promptly and appropriately (Kotler et al., 2009).

Waiting time is a major component that may lead to patient dissatisfaction and remains a common problem in health care facilities (Pramesthi and Prayoga, 2023). Waiting time can be defined as the length of time required for patients to obtain health care services, starting from registration until being attended by a physician. In Indonesia, waiting time standards are regulated by the Ministry of Health through minimum service standards. The standard waiting time indicator for outpatient services is 60 minutes. A waiting time exceeding 90 minutes is categorized as long, a duration of 30–60 minutes is considered moderate, and waiting times of less than 30 minutes are classified as short (Pramesthi and Prayoga, 2023).

In addition to waiting time, other factors may influence patient satisfaction. From a sociodemographic perspective, educational level is an important factor that affects patients' expectations and perceptions of the health care services they receive. Higher educational attainment is often associated with greater expectations and demands for health care services. Consequently, patients with higher levels of education may report lower satisfaction if the quality of services does not meet their expectations, highlighting the need for high quality care to achieve patient satisfaction (Ikenasya et al., 2018).

Based on the background described above and previous research findings regarding factors influencing outpatient satisfaction, inconsistencies have been identified across studies. Therefore, this study aims to address these inconsistencies by conducting a meta

analysis on the effects of waiting time and educational level on outpatient satisfaction.

SUBJECTS AND METHOD

1. Study Design

This study employed a systematic review and meta analysis design using secondary data derived from previously published studies. Data were obtained through a comprehensive and systematic search of electronic databases, including Google Scholar, Springer-Link, Elsevier, ScienceDirect, PubMed, Wiley, and Scopus, covering publications from 2018 to 2023. The keywords used in the literature search were “patient satisfaction” AND “waiting time” AND “short waiting time” AND “long waiting time” AND “educational level” AND “outpatient department”. A total of 13 primary research articles met the inclusion criteria and were included in this review.

2. Steps of the Meta Analysis

The first step was to formulate the research question using the PICO framework, where the population consisted of outpatient clinic patients, the interventions were long waiting time and higher educational level, the comparisons were short waiting time and lower educational level, and the outcome was patient satisfaction.

Next, a systematic search for primary studies was conducted based on the PICO criteria using electronic databases, including Google Scholar, ScienceDirect, Elsevier, SpringerLink, Wiley, Scopus, and PubMed.

Screening and critical appraisal of the identified primary studies were then performed to assess their eligibility and methodological quality.

The results from each included study were pooled to estimate the overall effect. Data analysis was conducted using Review Manager software version 5.4 to calculate adjusted odds ratios.

Finally, the pooled findings were interpreted and discussed, addressing several key issues, including study quality, heterogeneity, potential sources of bias, and the extent to which the results can be generalized to the populations represented in the reviewed studies.

3. Inclusion Criteria

The inclusion criteria comprised full text articles employing a cross sectional study design, using multivariable analysis with adjusted odds ratios as effect estimates, and involving outpatient participants, including both new and follow up patients.

4. Exclusion Criteria

The exclusion criteria included articles not published in English and studies published prior to 2018.

5. Operational Definition of Variables

Waiting time: The duration required by a patient to obtain health care services, starting from the registration process until admission to the physician’s examination room.

Educational level: The stage of formal education attained by an individual, determined by levels of educational development, learning objectives, and competencies achieved.

Patient satisfaction: The degree of patient’s positive emotional response resulting from their evaluation of health care service performance after comparing the services received with their prior expectations.

6. Study Instrument

Study quality was evaluated using a critical appraisal checklist specifically designed for cross sectional studies.

7. Data Analysis

The articles included in this study were selected using the PRISMA flow diagram and analyzed using Review Manager software version 5.3. The analysis calculated the effect size and heterogeneity (I^2) of the selected studies. The results of the data analysis were presented in the form of forest plots and funnel plots.

RESULTS

The initial database search yielded 3,342 articles. After removing duplicates, 1,692 articles remained, of which 352 met the criteria for full text review. Full text articles were excluded for several reasons, including the use of analyses other than logistic regression, study designs

other than cross-sectional, or articles not published in English. Following qualitative review, 13 articles met all inclusion criteria and were included in the meta-analysis.

The process of study selection is illustrated in the PRISMA flowchart (Figure 1). Figure 2 summarizes the distribution of studies included in the meta-analysis.

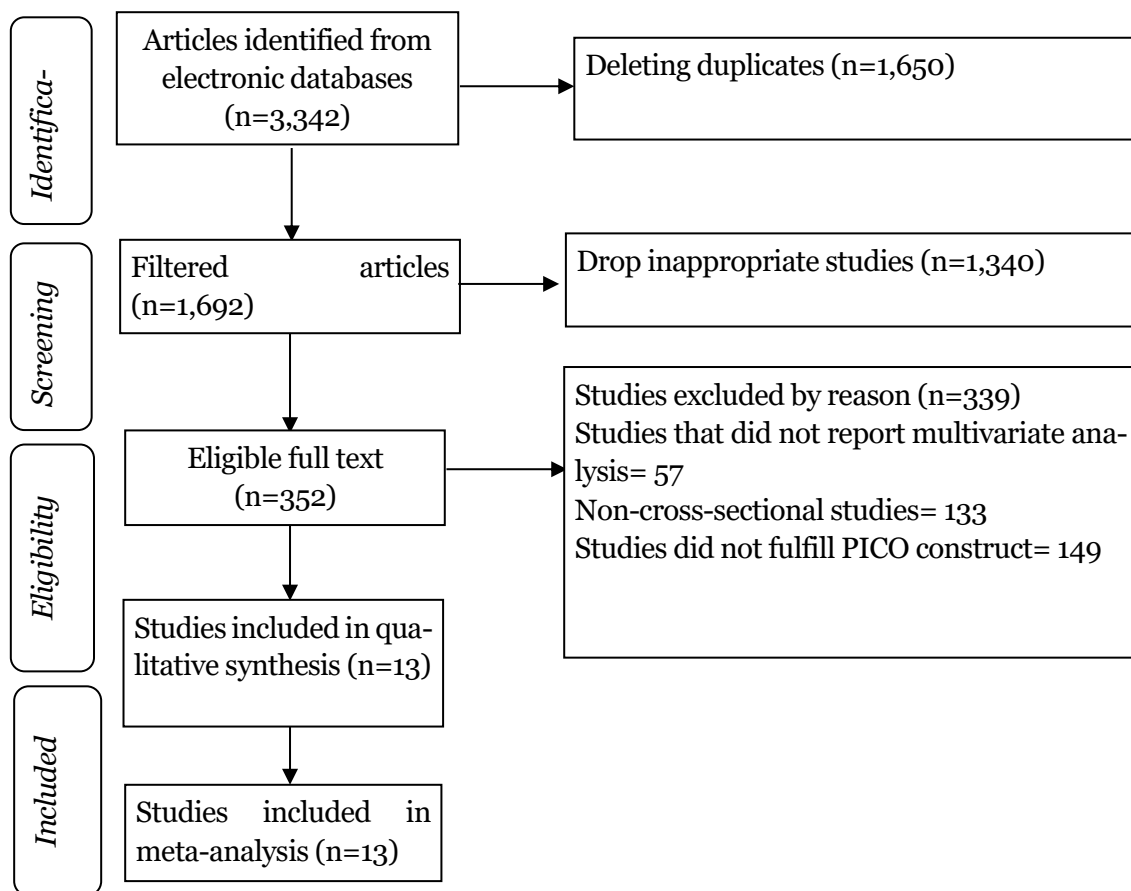


Figure 1. PRISMA Flowchart

The articles included in this meta-analysis were conducted in several countries. Specifically, the studies originated from Pakistan, Ethiopia, Fiji, and South Africa. Among the in-

cluded studies, Ethiopia contributed the largest number of articles, with four studies conducted in that country, while the remaining studies were conducted in Pakistan, Fiji, and South Africa.



Figure 2. Distribution Map of Studies Included in the Meta Analysis

Table 1. Critical Appraisal of Cross-Sectional Studies on the Relationship Between Short Waiting Time, High Educational Level, and Patient Satisfaction

Authors (Year)	Criteria													Total
	1a	1b	1c	1d	2a	2b	3a	3b	4	5	6a	6b	7	
Alanazi, et al (2023)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Ayele, et al (2020)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Desta, et al (2018)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Chandra, et al (2019)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Geberu, et al (2019)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Eshetie, et al (2020)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Kebede, et al (2021)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Yilma, et al (2021)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Buli, et al (2022)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Motloba, et al (2018)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Kabba, et al (2010)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Jalil, et al (2018)	2	2	2	2	2	2	2	2	2	2	2	2	2	26
Djordjevic et al. (2017)	2	2	2	2	2	2	2	2	2	2	2	2	2	26

Answer Scoring Key:

- 0: No
- 1: Uncertain
- 2: Yes

Question Items:

- 1a. Does the population in the primary study match the population defined in the meta-analysis PICO?
- 1b. Does the operational definition of the intervention (exposure status) in the

primary study match the definition intended in the meta-analysis?

- 1c. Does the comparator (non-exposed status) in the primary study match the definition intended in the meta-analysis?
- 1d. Does the outcome variable in the primary study match the definition intended in the meta-analysis?
- 2a. In analytic cross-sectional studies, did the researchers select the sample randomly?

- 2b. Alternatively, if the sample was not randomly selected, did the researchers select subjects based on outcome or intervention status?
- 3a. Were the exposure and outcome variables measured using the same instruments across all primary studies?
- 3b. If variables were measured on a categorical scale, were the cutoffs or categories consistent across primary studies?
- 4. If the sample was not randomly selected, did the researchers take steps to minimize selection bias? For example, ensuring that subject selection based on outcome status was not influenced by exposure status, or vice versa.
- 5. Did the primary study researchers take measures to control for confounding (e.g., performing multivariable analysis to adjust for confounding factors)?
- 6a. Did the primary study analyze data using multivariable models (e.g., multiple linear regression, multiple logistic regression)?
- 6b. Did the primary study report effect sizes or associations from the multivariable analysis (e.g., adjusted odds ratios, adjusted regression coefficients)?
- 7. Was there no potential conflict of interest with study sponsors that could bias the study conclusions?.

Table 2. Summary of Cross-Sectional Studies on the Relationship Between Patient Waiting Time and Patient Satisfaction (n=3,652)

Author	Country	Sample	P	I	C	O
Alanazi, et al (2023)	Pakistan	975	Patient in Punjab City, Pakistan	Longer waiting time	Shorter waiting time	Patient Satisfaction
Desta, et al (2018)	Ethiopia	415	Outpatients received mental health service	Wasting time >2	Wasting time <2	Patient satisfaction
Chandra, et al (2019)	Fiji	410	Outpatient department of suva sub-divisional health center	Waiting time >1	Waiting time <1	Patient satisfaction
Geberu, et al (2019)	Ethiopia	955	Adults outpatients departments of private wing and regular service	Waiting time >181 minutes	Waiting time <181 minutes	Patient satisfaction
Eshetie, et al (2020)	Ethiopia	413	Outpatient health service users	Waiting time to see doctor >2 hours	Waiting time to see doctor <2 hours	Patient satisfaction
Buli, et al (2022)	Ethiopia	335	Surgical patients	Waiting time more than 30 minutes	Waiting time less than 30 minutes	Patient satisfaction
Motloba, et al (2018)	Afrika Selatan	149	Patient at tertiary dental school	With waiting time	No waiting time	Patient satisfaction

Table 2 presents the sample size and PICO characteristics of the primary studies included in the meta-analysis with waiting time as the intervention. A total of seven studies

examined long waiting time, with the articles originating from Pakistan, Ethiopia, Fiji, and South Africa.

Table 3. Adjusted Odds Ratios (aOR) for the Effect of Waiting Time on Outpatient Satisfaction

Author (year)	aOR	95% CI	
		Lower limit	Upper limit
Alanazi 2023	0.68	0.48	0.96
Buli 2022	0.16	0.03	0.85
Chandra 2019	0.30	0.16	0.56
Desti 2018	0.01	0.00	0.05
Eshetie 2020	0.02	0.01	0.04
Geberu 2019	0.43	0.08	2.31
Motloba 2018	0.98	0.96	1.00

a. Forest plot

The forest plot shown the significant impact of waiting time on outpatient satisfaction. Longer waiting times were associated with lower levels of patient satisfaction. Patients who experienced longer waiting periods were 0.18 times as likely to be satisfied compared to those who waited for a shorter duration, and

this effect was statistically significant (aOR= 0.18; 95% CI= 0.06–0.49; p < 0.001).

The forest plot also demonstrates substantial variability in effect estimates across studies, with high heterogeneity (I²= 97%; p < 0.001). Therefore, the pooled effect estimate was calculated using a random-effects model.

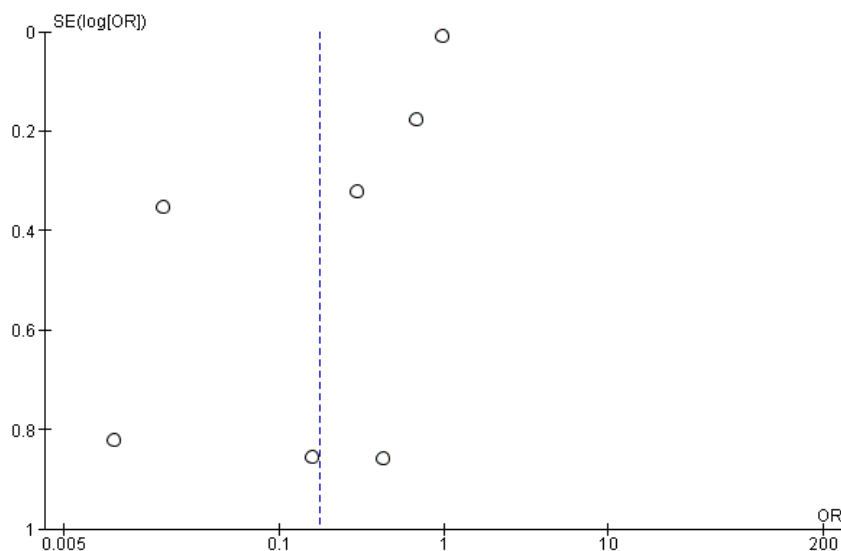


Figure 4. Funnel Plot Illustrating the Effect of Waiting Time on Outpatient Satisfaction

b. Funnel plot

The funnel plot in Figure 4 shows a greater concentration of effect estimates from smaller

studies on the left side of the vertical mean line compared to the right. This pattern indicates a

slight presence of publication bias. Since the effect estimates are predominantly located on the left—forming a diamond-like shape similar to that of the forest plot’s pooled

estimate—the observed publication bias is likely to result in an overestimation of the true effect.

Table 4. Summary of Cross-Sectional Studies on the Association Between Education Level and Patient Satisfaction (n=23,295)

Author	Country	n observation	P	I	C	O
Alanazi, et al (2023)	Pakistan	975	Patient in Punjab City, Pakistan	Higher education	Illiterate	Patient Satisfaction
Ayele, et al (2020)	Ethiopia	422	Patient with pharmacy service	Educational certificate and above	No formal education	Patient satisfaction
Kebede, et al (2021)	Ethiopia	414	Outpatient health service users	Diploma and above	District education	Patient satisfaction
Geberu, et al (2019)	Ethiopia	955	Adults outpatients departements of private wing and regular service	Waiting time >181 minutes	Waiting time <181 minutes	Patient satisfaction
Yilma, et al (2021)	Ethiopia	398	Patient with HIV/AIDS services	Education above grade 12	Unable to read and write	Patient Satisfaction
Kabba, et al (2020)	Sierra Leone	797	Patient with free healthcare pharmaceutical service	College university	No formal education	Patient Satisfaction
Jalil, et al (2018)	Pakistan	1,128	Diabetes patients	Completed 5 to 12 years and above	Illiterate	Patient Satisfaction
Djordjevic and Vasiljevic (2017)	Serbia	18,206	Patient health system used	High care education	Elementary	Patient Satisfaction

Table 4 presents the sample sizes and PICO characteristics of the studies included in the meta-analysis examining the effect of education level. A total of seven studies

investigated high education level interventions, with the studies conducted in Pakistan, Ethiopia, Sierra Leone, and Serbia.

Table 5. Adjusted Odds Ratios (aOR) for the Effect of Education Level on Patient Satisfaction

Author (year)	aOR	95% CI	
		Lower limit	Upper limit
Alanazi 2023	12.50	9.09	17.19
Ayele 2020	2.00	1.00	4.00
Djordjevic 2017	1.06	0.95	1.18
Jalil 2018	0.33	0.17	0.64
Kabba 2020	0.21	0.08	0.55
Kebede 2021	0.97	0.43	2.19
Yilma 2021	0.45	0.11	1.84

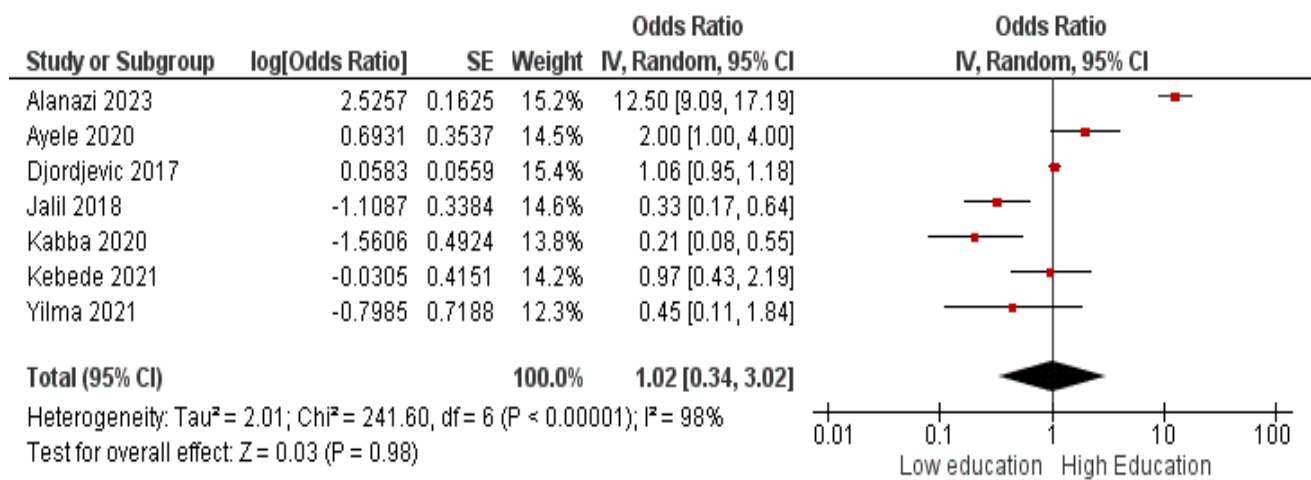


Figure 5. Forest Plot Illustrating the Effect of Education Level on Outpatient Satisfaction

a. Forest plot

The forest plot in Figure 5 indicates that education level has no significant effect on patient satisfaction. Patients with higher education were 1.02 times as likely to be satisfied compared to those with lower education, and this difference was not

statistically significant (aOR = 1.02; 95% CI = 0.34–3.02).

The forest plot also reveals substantial heterogeneity in effect estimates across studies (I² = 98%; p < 0.001). Therefore, the pooled effect estimate was calculated using a random-effects model.

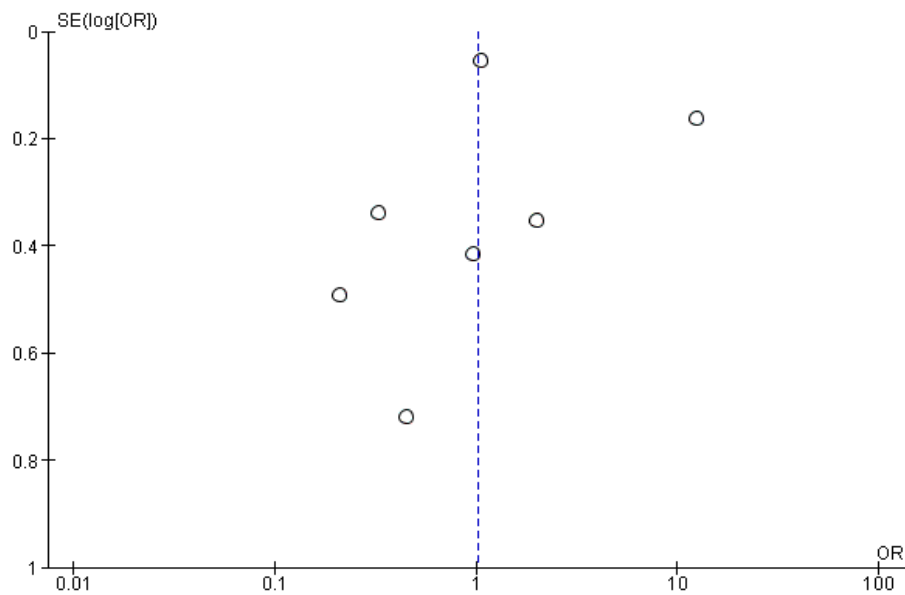


Figure 6. Funnel Plot Depicting the Effect of Education Level on Outpatient Satisfaction

b. Funnel plot

The funnel plot in Figure 6 shows that effect estimates are more concentrated on the left side of the vertical line representing the pooled effect than on the right. This pattern suggests the presence of slight publication bias in the meta-analysis. Because the distribution of effect estimates is skewed toward the left—corresponding to the position of the pooled diamond in the forest plot shown in Figure 5—the observed publication bias is likely to lead to an underestimation of the true effect.

DISCUSSION

1. Effect of Waiting Time on Outpatient Satisfaction

This study found a significant association between waiting time and outpatient satisfaction. According to Al-Harajin et al. (2019), waiting time is an important indicator for assessing patient satisfaction, as it reflects the efficiency of healthcare service delivery. Shorter waiting times indicate more prompt service provision, allowing patients to receive

care more quickly, which in turn enhances satisfaction. Conversely, prolonged waiting times suggest delays in service delivery, leading to reduced patient satisfaction with healthcare services.

Alrasheedi (2019), suggested that ideally, patients should not be required to wait to meet healthcare providers and receive medical services. However, in practice, waiting is a common experience in healthcare settings. Therefore, improvements in healthcare management are necessary to reduce patient waiting times in order to enhance overall patient satisfaction with healthcare facilities.

2. Effect of Education Level on Outpatient Satisfaction

This study also examined the relationship between education level and patient satisfaction. Patients with higher education levels were 1.02 times more likely to be satisfied compared to those with lower education levels; however, this association was not statistically significant.

Morte et al. (2022) reported that patients with higher educational attainment tend to utilize available healthcare facilities more effectively, which may lead to better perceived service quality and increased satisfaction. Higher education enables patients to better understand healthcare services and facilitates easier access to and use of available facilities.

In contrast, Adhikari et al. (2021) noted that patients with higher education levels are generally more capable of understanding the services provided and assessing whether these services meet their needs. Higher educational attainment may also make patients more critical of healthcare services, requiring healthcare providers to spend additional time explaining procedures and care. Nevertheless, such interactions are important, as they can ultimately contribute to improved patient satisfaction with healthcare services.

AUTHOR CONTRIBUTION

All authors made significant contributions to data analysis and the preparation of the final manuscript.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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