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META-ANALYSIS: APPLICATION OF HEALTH BELIEF MODEL THEORY ON COVID-19 VACCINE ACCEPTANCE

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ABSTRACT

The Health Belief Model (HBM) helps in understanding health-related behaviors and is used to explore factors that influence the acceptance of COVID-19 vaccines. This exploration serves as the basis for designing more effective intervention programs to increase vaccine acceptance, both for COVID-19 and future vaccination programs. This study aims to analyze and estimate the impact of applying the Health Belief Model on the acceptance of COVID-19 vaccines. Methods: This study is a meta-analysis using the PICO model. Population: adults. Intervention: high perceived susceptibility, high perceived severity, high perceived benefits. Comparison: low perceived susceptibility, low perceived severity, low perceived benefits. Outcome: acceptance of COVID-19 vaccination. The research data was sourced from Google Scholar, ScienceDirect, and PubMed, using keywords "Health Belief Model" AND "HBM" AND "Vaccine COVID-19 Acceptance" OR "Receive" AND "Vaccine COVID-19 Hesitancy". The inclusion criteria for articles in the meta-analysis were articles published between 2020 and 2022 in English. Analysis was performed using the RevMan 5.4 application. Results: A meta-analysis was conducted on 15 cross-sectional studies from Asia and Europe with a total sample size of 19,814 people. High perceived susceptibility (aOR= 1.28; 95% CI= 1.10 to 1.49; p= 0.001), high perceived severity (aOR= 1.24; 95% CI= 1.04 to 1.48; p= 0.020), and high perceived benefits (aOR= 2.64; 95% CI= 1.73 to 4.02; p<0.001) towards COVID-19 were found to increase the acceptance of COVID-19 vaccination, and these results were statistically significant. Conclusion: High perceived susceptibility, high perceived severity, and high perceived benefits towards COVID-19 increase the acceptance of COVID-19 vaccination.

Keywords: covid-19; hbm; perceived benefits; perceived severity; perceived susceptibility; vaccination

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INTRODUCTION

COVID-19 vaccination has been identified as one of the most effective strategies to control the spread of the virus and reduce the impact of the COVID-19 pandemic (Harapan et al., 2020). However, the initial implementation of this vaccination program encountered various challenges and resistance. According to data from 2021, nearly 80 countries, including Indonesia, did not meet their vaccination targets of 40 percent of the population by the end of 2021. The vaccination process continued, and by February 2022, full vaccination had reached only 66% of the WHO target (Nugraheny, 2021). Nonetheless, with improvements in COVID-19 vaccination programs, many countries succeeded in reaching or even exceeding their vaccination targets. As of March 24, 2024, the COVID-19 vaccination rate in Indonesia showed a positive trend, with first-dose coverage reaching 86.8%, surpassing the target set for 2023. This indicates a successful effort in raising awareness and public participation in vaccination (Kemenkes RI, 2024).

The phenomenon of COVID-19 vaccination acceptance can be explained through the Health Belief Model (HBM). Initially, many individuals experienced hesitation towards COVID-19 vaccination due to high perceived risk and low perceived benefits. Factors such as uncertainty about vaccine efficacy and safety, as well as concerns about side effects, influenced the decision to get vaccinated. Additionally, there was distrust in the information provided by health authorities (Pourrazavi et al., 2023; Sharma et al., 2021). However, by applying the HBM to COVID-19 vaccination acceptance through educational campaigns, health promotion, and transparent communication helped strengthen public confidence in the benefits of vaccination and increased compliance with vaccination programs (Chen et al., 2021). The HBM provides a framework for implementing vaccination programs that helps individuals feel more confident and accepting of COVID-19 vaccination (Kim and Kim, 2020). Although many studies have applied the HBM in the context of COVID-19 vaccination acceptance, few have conducted a comprehensive analysis by gathering and examining findings from these studies. Meta-analysis is a statistical method that allows for the synthesis of findings from various relevant studies to provide an overall perspective on the relationships between certain variables (Paul and Barari, 2022).

The results of a meta-analysis on the application of the HBM can evaluate the extent to which this theory is relevant and predictable across different populations and contexts. These findings form the basis for designing more effective intervention programs to increase vaccine acceptance, not only for COVID-19 but also for future vaccination programs. By understanding the factors that influence individuals' decisions regarding vaccination, more targeted strategies can be identified to increase compliance with vaccination. Based on this background, the current study aims to analyze and estimate the impact of applying the Health Belief Model on COVID-19 vaccine acceptance through a meta-analysis of primary studies conducted by previous researchers.

METHOD

This study uses a meta-analysis approach. The data utilized comes from a search for primary articles from databases such as Google Scholar, Science Direct, and PubMed between 2020 and 2022. The search was conducted using the keywords "Health Belief Model" AND "HBM" AND "Vaccine COVID-19 Acceptance" OR "Receive" AND "Vaccine COVID-19 Hesitancy." The meta-analysis was conducted in five steps including (1) Formulate a research question using the PICO (Population, Intervention, Control/Comparisons, Outcome) format. (2) Search for primary study articles from various electronic and non-electronic databases such as PubMed, Google Scholar, and Science Direct. (3) Apply screening to establish inclusion and exclusion criteria and perform critical appraisal. (4) Extract data from primary studies and synthesize effect estimates using the Revman 5.3 application. (5) Interpret results and conclude.

The inclusion criteria for this study include full-text articles with a Cross-Sectional research method from 2020 to 2023, with interventions based on the Health Belief Model theory (perceived susceptibility, perceived severity, perceived benefits), and the outcome analyzing COVID-19 vaccine acceptance, reported with adjusted odds ratio (aOR). The exclusion criteria for this study include research with randomized controlled trials and cohort designs, articles in languages other than Indonesian and English, and articles with crude results. The operational definitions of variables in this study were, COVID-19 Vaccine Acceptance refers to the action reflecting an individual's attitude or decision to accept or refuse the COVID-19 vaccine. Perceived susceptibility refers to an individual's belief about how susceptible they are to a particular disease or health condition. Perceived severity refers to an individual's

perception of the level of severity or impact a disease or health condition would have if it occurred. Perceived benefits refer to an individual's belief in the benefits of adopting a specific health behavior.

The study was guided by the PRISMA flow diagram, and the quality assessment was conducted according to the Centre for Evidence-Based Medicine (CEBM) worksheet. Data analysis was performed using Review Manager software version 5.3. A Forest Plot was used to depict effect sizes, and a Funnel Plot to illustrate publication bias. The analysis included calculating the consistency of heterogeneity (I2) from the study results used.

RESULTS

The data used in this systematic review and meta-analysis were obtained from a search for primary articles in databases such as Google Scholar, Science Direct, and PubMed from 2010 to 2023. The retrieved articles were then selected and reviewed using the PRISMA flow diagram. Figure 1 shows the initial search results, where a total of 587 articles were obtained. After removing duplicate articles, the total number of articles was reduced to 262. At the screening stage, 38 articles were retained after excluding 234 articles for not meeting the criteria. Reasons for exclusion included the articles being irrelevant, not having a cross-sectional study design, not being full-text, or not being in English or Indonesian. The researchers reviewed the 38 remaining articles and identified 15 articles that qualified for qualitative and quantitative meta-analysis synthesis (Figure 1).

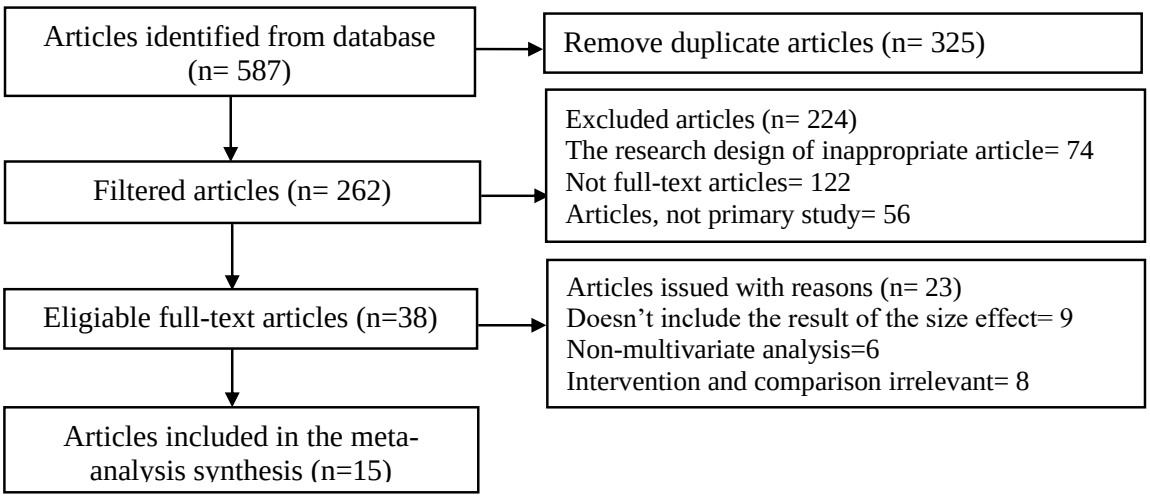

Figure 1.
PRISMA flow diagram

Research on the application of the Health Belief Model to COVID-19 vaccine acceptance consists of 15 studies from two continents: Asia and Europe. Among these, 13 studies from Asia come from countries such as China, India, Bangladesh, Hong Kong, South Korea, Vietnam, and Pakistan. The research from Europe originates from the United Kingdom. Figure 2 shows the geographic distribution of the study sites, illustrated on a world map.

Table 1.
Quality Assessment of Cross-Sectional Studies on the Application of the Health Belief Model to COVID-19 Vaccine Acceptance

Primary Studies	Score												
	1	2	3	4	5	6	7	8	9	10	11	12	Total
Goruntla et al. (2021)	2	2	2	2	2	2	2	2	2	2	2	2	24
Patwary et al. (2021)	2	2	2	1	2	2	2	2	2	2	2	2	23
Wong et al. (2022)	2	2	2	2	2	2	2	2	2	2	2	2	24
Wang et al. (2022)	2	2	2	1	2	2	2	2	2	2	2	2	23
Walsh et al. (2022)	2	2	2	2	2	2	2	2	2	2	2	2	24
Lee dan You (2022)	2	2	2	2	2	2	2	2	2	2	2	2	24
Le et al. (2022)	2	2	2	1	2	2	2	2	2	2	2	2	23
Banik et al. (2021)	2	2	2	1	2	2	2	2	2	2	2	2	23
Hawlader et al. (2020)	2	2	2	2	2	2	2	2	2	2	2	2	24
Hossain et al. (2021)	2	2	2	2	2	2	2	2	2	2	2	2	24
Wang et al. (2021)	2	2	2	2	2	2	2	2	2	2	2	2	24
Lai et al. (2021)	2	2	2	2	2	2	2	2	2	2	2	2	24
Qin et al. (2022)	2	2	2	2	2	2	2	2	2	2	2	2	24
Coe et al. (2020)	2	2	1	1	2	2	2	2	2	2	2	2	22
Mahmud et al. (2021)	2	2	2	2	2	2	2	2	2	2	2	2	24

Question Criteria:
1 = Does the study address a clearly focused question/problem?
2 = Is the research method (study design) appropriate to answer the research question?
3 = Is the method of selecting subjects (employees, teams, divisions, organizations) clearly explained?
4 = Could the way the sample was obtained introduce (selection) bias?
5 = Are the subjects in the sample representative of the target population for those findings?
6 = Was the sample size based on pre-study statistical power considerations?
7 = Was a satisfactory response rate achieved?
8 = Are the measurements (questionnaires) likely to be valid and reliable?
9 = Was statistical significance assessed?
10 = Were confidence intervals provided for the primary outcomes?
11 = Could there be unrecorded confounding factors?
12 = Are the results applicable to your organization?
Score
0 = No
1 = Can’t Tell
2 = Yes

After assessing the quality of the research, 15 articles with a Cross-Sectional study design were identified for use as sources for a meta-analysis on the impact of applying the Health Belief Model to COVID-19 vaccine acceptance. These articles were then extracted and summarized according to the study's PICO framework.

Table 2.
Cross-sectional primary study article summary with each PICO (N=19,814)

Author (Year)	Country	Total sample	P	I	C	O
Goruntla et al. (2021)	India	2,480	Adults aged 18 to 70	High Perceived Susceptibility, High Perceived Severity, High Perceived Benefits	Low Perceived Susceptibility, Low Perceived Severity, Low Perceived Benefits	COVID-19 Vaccination Acceptance
Patwary et al. (2021)	Bangladesh	639	Adults aged 24	High Perceived Susceptibility, High Perceived Severity, High Perceived Benefits	Low Perceived Susceptibility, Low Perceived Severity, Low Perceived Benefits	COVID-19 Vaccination Acceptance
Wong et al. (2022)	Hongkong	1,200	Adults over 18 years old	High Perceived Susceptibility, High Perceived Severity, High Perceived Benefits	Low Perceived Susceptibility, Low Perceived Severity, Low Perceived Benefits	COVID-19 Vaccination Acceptance
Wang et al. (2022)	China	483	Adults aged 18 to 70	High Perceived Susceptibility, High Perceived Severity, High Perceived Benefits	Low Perceived Susceptibility, Low Perceived Severity, Low Perceived Benefits	COVID-19 Vaccination Acceptance
Walsh et al. (2022)	Ireland and United Kingdom	1,079	Adults over 18 years old	High Perceived Susceptibility, High Perceived Severity, High Perceived Benefits	Low Perceived Susceptibility, Low Perceived Severity, Low Perceived Benefits	COVID-19 Vaccination Acceptance
Lee and You (2022)	South Korea	1,016	Adults over 18 years old	High Perceived Susceptibility, High Perceived Severity	Low Perceived Susceptibility, Low Perceived Severity	COVID-19 Vaccination Acceptance
Le et al. (2022)	Vietnam	911	Adults over 18 years old	High Perceived Susceptibility, High Perceived Severity, High Perceived Benefits	Low Perceived Susceptibility, Low Perceived Severity, Low Perceived Benefits	COVID-19 Vaccination Acceptance
Banik et al. (2021)	Bangladesh	894	Adults aged 18 to 60	High Perceived Susceptibility, High Perceived Severity, High Perceived Benefits	Low Perceived Susceptibility, Low Perceived Severity, Low Perceived Benefits	COVID-19 Vaccination Acceptance
Hawlader et al. (2020)	Pakistan	2,084	Adults over 18 years old	High Perceived Susceptibility, High Perceived Severity, High Perceived Benefits	Low Perceived Susceptibility, Low Perceived Severity, Low Perceived Benefits	COVID-19 Vaccination Acceptance
Hossain et al. (2021)	Bangladesh	1,497	Adults over 18 years old	High Perceived Susceptibility, High Perceived Severity, High Perceived Benefits	Low Perceived Susceptibility, Low Perceived Severity, Low Perceived Benefits	COVID-19 Vaccination Acceptance
Wang et al. (2021)	China	833	Adults over 16 years old	High Perceived Susceptibility, High Perceived Severity, High Perceived Benefits	Low Perceived Susceptibility, Low Perceived Severity, Low Perceived Benefits	COVID-19 Vaccination Acceptance
Lai et al. (2021)	China	1,145	Adults over 18 years old	High Perceived Susceptibility, High Perceived Severity,	Low Perceived Susceptibility, Low Perceived Severity,	COVID-19 Vaccination Acceptance

Author (Year)	Country	Total sample	P	I	C	O
				High Perceived Benefits	Low Perceived Benefits	

Table 3.
Data aOR and CI data95% of applications perceived susceptibility in COVID-19 vaccination receipt

Author (Year)	aOR	CI95%	
		Lower Limit	Upper Limit
Goruntla et al. (2021)	1.63	1.26	2.11
Patwary et al. (2021)	1.73	1.20	2.51
Wong et al. (2021)	0.98	0.83	1.17
Wang et al. (2022)	0.79	0.47	1.32
Walsh et al. (2022)	1.23	0.88	1.72
Lee et al. (2022)	1.47	1.11	1.96
Le et al. (2022)	0.34	0.16	0.70
Banik et al. (2021)	1.64	1.06	2.53
Hawlader et al. (2022)	1.46	1.24	1.72
Hossain et al. (2021)	1.07	0.99	1.17
Wang et al. (2021)	1.16	0.91	1.46
Lai et al. (2021)	1.03	0.59	1.80
Qin et al. (2021)	2.48	1.42	4.31
Coe et al. (2022)	1.01	0.81	1.27
Mahmud et al. (2021)	2.16	1.65	2.82

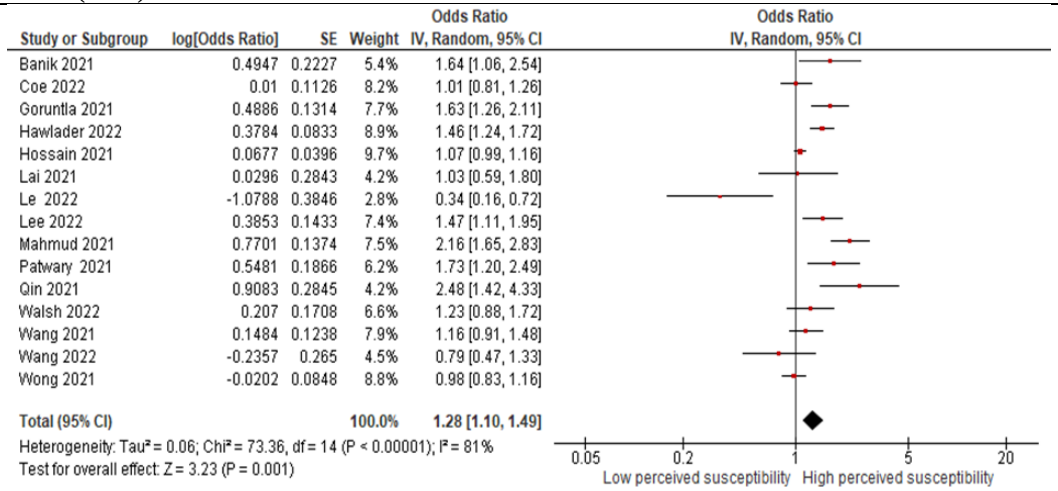

Figure 3. Forest plot application of perceived susceptibility in COVID-19 vaccination acceptance

Based on Figure 3, it can be seen that high perceived susceptibility to COVID-19 increases COVID-19 vaccine acceptance by 1.28 times, and this result is statistically significant (aOR= 1.28; 95% CI= 1.10 to 1.49; p= 0.001). The heterogeneity in this data set is high (I2= 81%; p<0.001), prompting the use of a Random Effects Model in the meta-analysis.

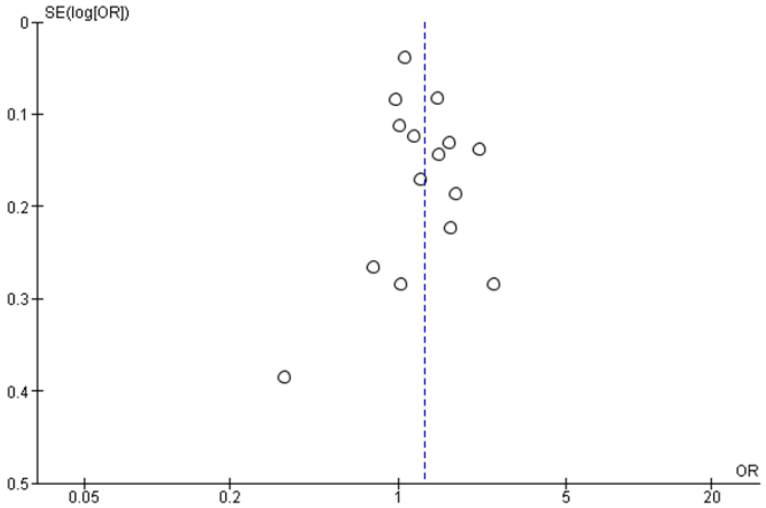

Figure 4. Funnel plot illustrating the application of perceived susceptibility in COVID-19 vaccine acceptance

Figure 4 shows no indication of publication bias, as evidenced by the symmetrical distribution between the right and left plots. There are 8 dots on the left side and 7 dots on the right side. The plots on the left side of the graph have a standard error (SE) between 0 and 0.4, while the plots on the right side have a standard error (SE) between 0.1 and 0.3.

Table 4.
Data on aOR and 95% CI for the application of perceived severity in COVID-19 vaccine acceptance

Author (Year)	aOR	CI95%	
		Lower Limit	Upper Limit
Goruntla et al. (2021)	1.29	0.99	1.69
Patwary et al. (2021)	0.67	0.42	1.06
Wong et al. (2021)	1.16	1.01	1.32
Wang et al. (2022)	3.90	2.36	6.42
Walsh et al. (2022)	1.96	0.89	2.50
Lee et al. (2022)	1.12	0.84	1.49
Le et al. (2022)	0.43	0.19	0.98
Banik et al. (2021)	0.94	0.60	1.47
Hawlader et al. (2022)	1.08	0.94	1.24
Hossain et al. (2021)	1.07	0.98	1.17
Wang et al. (2021)	1.12	0.87	1.45
Lai et al. (2021)	1.14	0.67	1.96
Qin et al. (2021)	0.48	0.15	1.56
Coe et al. (2022)	1.44	1.09	1.91
Mahmud et al. (2021)	2.68	2.11	3.41

Based on Figure 5, it can be seen that the high perceived severity of COVID-19 increases COVID-19 vaccine acceptance by 1.24 times, and this result is statistically significant (aOR= 1.24; 95% CI= 1.04 to 1.48; p= 0.020). The heterogeneity in this dataset is high (I2= 85%; p<0.001), indicating that the meta-analysis employs a Random Effects Model. Figure 6 shows evidence of publication bias, indicated by an asymmetrical distribution between the right and left plots. There are 10 dots on the left side, 4 on the right side, and 1 along the center line. The plots on the left side of the graph have a standard error (SE) between 0 and 0.8, while the plots on the right side have a standard error (SE) between 0.1 and 0.8.

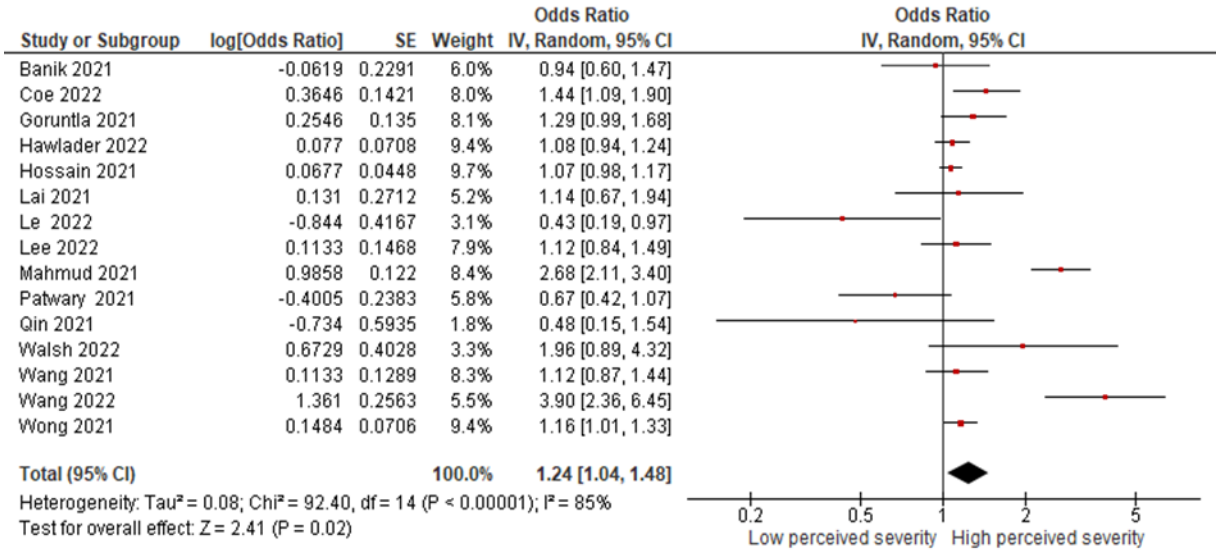

Figure 5. Forest plot of the application of perceived severity in COVID-19 vaccination acceptance

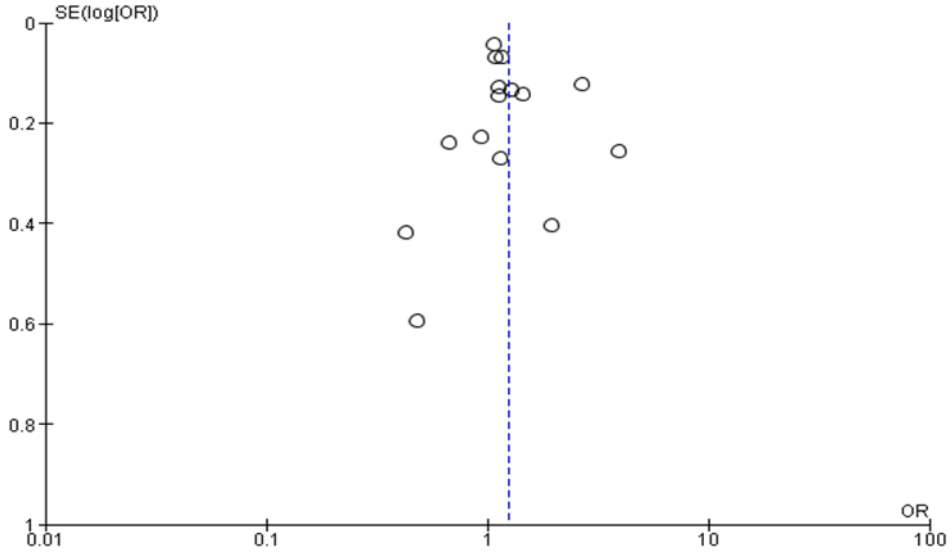

Figure 6. Funnel plot of the application of perceived severity in COVID-19 vaccination acceptance

Table 5.
Data on aOR and 95% CI for the application of perceived benefits in COVID-19 vaccine acceptance

Author (Year)	aOR	CI95%	
		Lower Limit	Upper Limit
Goruntla et al. (2021)	4.31	3.31	5.62
Patwary et al. (2021)	2.02	1.26	3.25
Wong et al. (2021)	1.22	1.01	1.48
Wang et al. (2022)	0.65	0.41	1.03
Walsh et al. (2022)	1.96	1.47	3.30
Lee et al. (2022)	16.66	11.11	25.00
Banik et al. (2021)	3.08	1.82	5.19
Hawlader et al. (2022)	2.93	2.47	3.47
Hossain et al. (2021)	1.17	1.09	1.26
Wang et al. (2021)	3.56	2.54	4.98
Lai et al. (2021)	1.64	1.04	2.61

Author (Year)	aOR	CI95%	
		Lower Limit	Upper Limit
Qin et al. (2021)	1.78	0.56	5.66
Coe et al. (2022)	1.77	1.41	2.21
Mahmud et al. (2021)	16.3	11.2	22.2

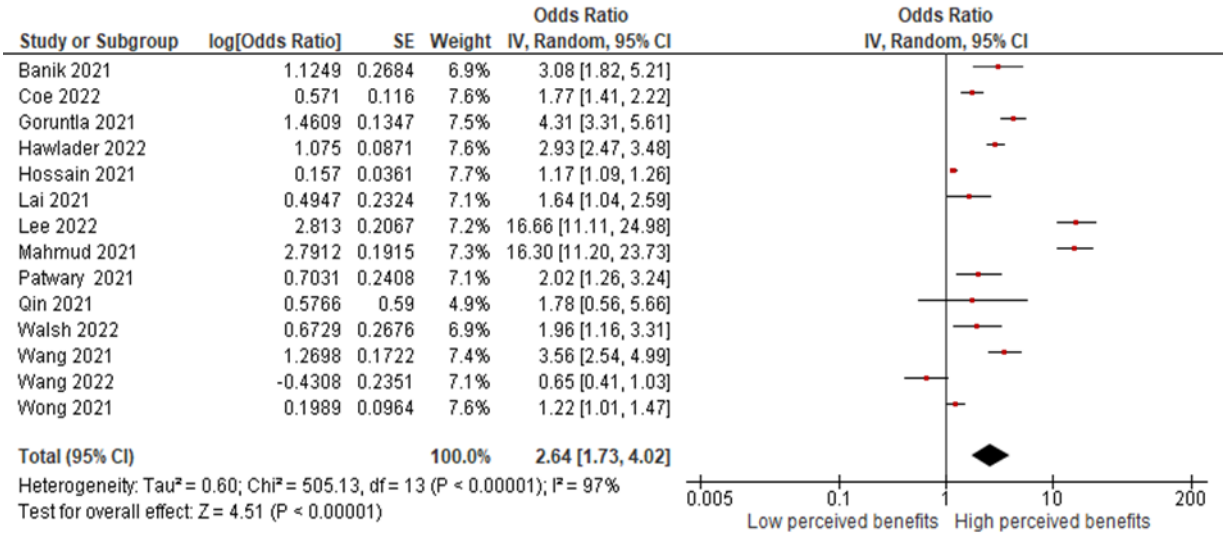

Figure 7. Forest plot for the application of perceived benefits in COVID-19 vaccine acceptance

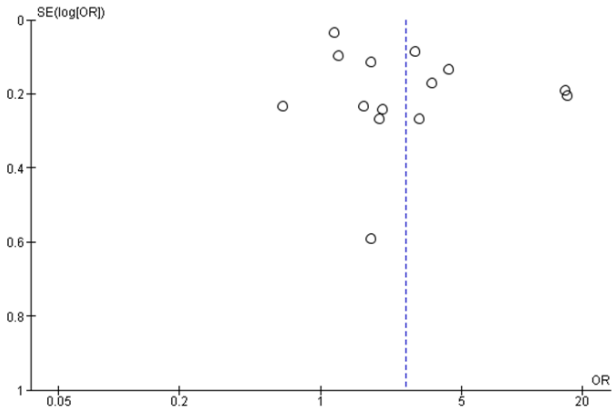

Figure 8. Funnel plot for the application of perceived benefits in COVID-19 vaccine acceptance

DISCUSSION

This meta-analysis provides strong evidence for the application of the Health Belief Model (HBM) in predicting COVID-19 vaccine acceptance. The findings indicate that individual perceptions of susceptibility, severity, and benefits of COVID-19 are significant predictors of their willingness to receive the vaccine.

Perceived Susceptibility

The study shows that high perceived susceptibility to COVID-19 increases COVID-19 vaccine acceptance by 1.28 times, with statistically significant results (aOR= 1.28; 95% CI= 1.10 to 1.49; p= 0.001). Perceived susceptibility is a component of HBM focusing on the extent to which a person feels at risk of contracting a disease or experiencing a specific health condition. These findings align with the HBM assumption that individuals who perceive themselves as being at greater risk are more likely to take preventive actions (Ban and Kim, 2020). A study by Walsh et al. (2022) also found similar results, showing that individuals who feel highly susceptible to COVID-19 are more likely to get vaccinated (OR=

1.18; 95% CI= 0.58 to 2.38). This indicates that public health campaigns emphasizing personal risk can be effective in promoting vaccine uptake.

Another study by Coe et al. (2020) stated that individuals who consider the severity of the virus to be high are more likely to accept the COVID-19 vaccine (OR= 1.44; 95% CI= 1.09 to 1.91). Awareness of susceptibility risks can prompt individuals to seek ways to protect themselves, and vaccination is one of the most effective protective measures. However, perceived susceptibility does not always correlate directly with vaccine acceptance. Other factors, such as trust in the healthcare system, knowledge about vaccines, and perceptions of benefits and barriers, also play crucial roles. For example, individuals living in communities with high vaccination rates are more likely to get vaccinated (Hossain et al., 2021). Increased acceptance of vaccination caused by high perceived susceptibility may also help in reducing stigma towards vaccination. Cai et al. (2022) explained that when individuals have the perception that they are more susceptible to COVID-19, they are more likely to accept vaccination as a way to protect the health of themselves and others. This can help reduce the stigma towards vaccination, which can influence individual behavior in dealing with COVID-19.

Perceived Severity

This study indicates that high perceived severity of COVID-19 increases COVID-19 vaccine acceptance by 1.24 times, with statistically significant results (aOR= 1.24; 95% CI= 1.04 to 1.48; p= 0.020). Perceived severity measures an individual's view of the serious consequences of the disease. Studies show that the higher the perceived severity, the more likely an individual is to accept the vaccine. This may be due to fear of severe outcomes from COVID-19, such as hospitalization or death, which drives individuals to seek protection through vaccination (Park et al., 2021). Findings from Wang (2021) show that people who consider COVID-19 a serious threat are more likely to accept vaccination (aOR= 1.12; 95% CI= 0.87 to 1.45). Those who believe that COVID-19 is a severe disease are more inclined to get vaccinated, as they are more aware of the potential risks and complications that can arise from the disease. Walsh et al. (2022) in their study also mentioned that perceived severity often drives vaccination decisions (aOR= 1.27; 95% CI= 0.90 to 1.79). This is because individuals with high perceived severity tend to view COVID-19 as a serious threat to their health and life. Consequently, they are more motivated to take preventive actions, such as vaccination, to reduce the risk of severe outcomes.

Factors that can increase perceived severity include information on COVID-19 mortality rates, personal experiences or stories from others affected severely, and recommendations from trusted sources like healthcare professionals or health authorities. News and media can also influence perceived severity by highlighting severe cases or rising infection rates (Talebi et al., 2022). In a global context, the intensity of perception can also be influenced by various cultural and social factors. In some countries, the impact of COVID-19 is so severe and widespread, that the public may be more likely to view the disease as a serious threat, increasing vaccine acceptance. Conversely, in countries or communities where the direct impact of COVID-19 is less pronounced, perception levels may be lower and, as a result, vaccine acceptance rates may also be lower. Therefore, health communication strategies must be adapted to the local context to maximize their effectiveness (Ramaiya et al., 2024). Although perceived severity can increase COVID-19 vaccination, perceived severity must work in synergy with other factors such as perception, vulnerability, and barriers. For example, even though someone may be aware that COVID-19 can be fatal, they may still be reluctant to do so if they do not believe in the effectiveness of the vaccine or are worried about the surrounding effects. Therefore, to increase vaccination rates, health campaigns

must not only emphasize the severity of COVID-19 but also provide clear and convincing information about the benefits of vaccines and overcome perceived barriers (Lyons et al., 2023).

Perceived Benefits

This study also analyzed the perceived benefits of the COVID-19 vaccine. Perceived benefits refer to the extent to which someone believes that a certain action, such as vaccination, can provide protection or other benefits. The meta-analysis results indicate that high perceived benefits increase COVID-19 vaccine acceptance by 2.64 times, with statistically significant results (aOR= 2.64; 95% CI= 1.73 to 4.02; p<0.001). This outcome is supported by prior research conducted by Goruntla et al. (2021), where individuals with high perceived benefits of COVID-19 vaccination, such as reduced worry (OR= 5.87; 95% CI= 4.39 to 7.96) and reduced illness (OR 4.31; 95% CI= 3.31 to 5.62), were more likely to accept the vaccine. This finding is consistent with the HBM assumption that individuals who perceive that the benefits of a health behavior outweigh its costs are more likely to engage in that behavior.

Previous research by Patwary et al. (2021) also indicates that perceived benefits drive the decision to vaccinate (aOR = 2.00; 95% CI = 1.29 to 3.09). When individuals have high perceived benefits related to COVID-19 vaccination, they are more likely to get vaccinated. The belief that the vaccine can help protect against infection, reduce the severity of symptoms if infected, and prevent the spread to others can motivate someone to get vaccinated. In addition to direct health benefits, perceived benefits also include social and economic aspects. For example, getting a COVID-19 vaccine allows people to safely return to work, participate in social activities, and travel. For many individuals, these benefits are significant and provide additional motivation to receive the vaccine. The study by Reiter et al. (2020) found that individuals who viewed vaccination as a way to protect their families and communities from COVID-19 were more likely to be willing to be vaccinated.

Moreover, perceived benefits also need to be integrated with strategies to overcome perceived barriers and increase perceived susceptibility. Even though someone may recognize the benefits of vaccines, they may still be reluctant to get vaccinated if they feel barriers such as accessibility, cost, or concerns about side effects are too great (Haque-Fawzi, 2021). High perceived benefits may be driven by better understanding, reinforced by clear information and public health campaigns that highlight the benefits of vaccination, such as how vaccination can protect against serious COVID-19 consequences, reduce transmission risk, help protect the community as a whole, reduce the burden on the healthcare system, and enable society to return to normal activities. Support from healthcare workers and health authorities emphasizing the benefits of vaccination plays a crucial role in shaping this perception (Kementerian Kesehatan RI, 2020). The findings from this meta-analysis have implications for developing interventions aimed at increasing COVID-19 vaccine acceptance. The results emphasize the importance of tailoring public health interventions to address individuals' specific perceptions and concerns regarding COVID-19 vaccination. By understanding the factors related to how perceived susceptibility, severity, and benefits influence vaccine acceptance, healthcare professionals and policymakers can develop more effective and targeted strategies to promote vaccine uptake (Limbu and Gautam, 2023).

CONCLUSION

In conclusion, this study supports the application of the Health Belief Model in predicting COVID-19 vaccine acceptance. Interventions aimed at increasing individuals' perceptions of susceptibility, severity, and benefits of COVID-19 may lead to higher vaccine acceptance. Further research is needed to explore the role of other factors in predicting vaccine acceptance and to develop effective interventions to increase vaccine uptake.

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