International Journal of Social Science and Human Research

ISSN (print): 2644-0679, ISSN (online): 2644-0695

Volume 07 Issue 03 March 2024

DOI: 10.47191/ijsshr/v7-i03-86**,** Impact factor- 7.876

Page No: 2157-2162

Public Perception of the Effectiveness of Vaccination against the Level of Anxiety Exposed to Covid-19

Made Susilawati[1], I Komang Gde Sukarsa[2], I Putu Eka Nila Kencana[3], Ni Luh Putu Suciptawati[4], Desak Putu Eka Nilakusmawati[5], Fairuz Parawanti[6]

[1,2,3,4,5,6] Mathematics Department, Udayana University, Badung, Bali, Indonesia

ABSTRACT: This research aims to find out how people's perceptions about effectiveness of vaccination on the level of anxiety exposed to Covid-19 which is influenced by knowledge. The sampling technique used accidental sampling. Nine districts and cities in Bali were included in the samples and 190 respondents in all. Questionnaires as research instruments and primary data are the types of data used. The Structural Equation Modeling-Partial Least Square (SEM-PLS) analysis approach was used in this study. The variables in this research consist of exogenous latent variables (knowledge), mediating latent variables (effectiveness), and endogenous latent variables (anxiety). By considering the results of hypothesis testing carried out through the bootstrapping process, the study revealed that better knowledge about Covid-19 can increase the effectiveness of vaccination by 78.9%, better knowledge about Covid-19 can reduce anxiety levels by 23.2%, increased vaccination effectiveness results in a decrease in anxiety levels by 29.4%, and better knowledge about Covid-19 can indirectly reduce anxiety levels through vaccination effectiveness by 59.3%. As a result, H0 gets dismissed in the hypothesis test, which indicates that knowledge significantly affects anxiety, both directly and indirectly through the mediation of vaccination effectiveness.

KEYWORDS: knowledge, effectiveness, vaccination, anxiety, covid-19.

I. INTRODUCTION

One of the diseases caused by *severe acute respiratory syndrome coronavirus* 2 (SARS-CoV-2) with a very fast transmission rate has a negative impact on all aspects of life, especially the increase in death cases and in March 2020 it was declared a Covid-19 pandemic [1]. According to statistical data obtained in July 2022, it is known that as many as 6,130,000 people were verified positive for Covid-19 and 157,000 people were declared dead in the world.

Based on the frequency of Covid-19 cases, the main goal is to create a safe and effective vaccine so that it can form an immune response against the *Corona virus*. Several efforts were made by the government to reduce the negative impact of the pandemic through the formation of a team to develop vaccines based on Presidential Decree Number 18/2020 dated September 3, 2020 and the issuance and signing of a Presidential Regulation on vaccination making and implementing vaccination programs on October 6, 2020 [2].

Bali as one of the provinces with a fairly high vaccination rate obtained data on people who have received the first dose of vaccination as much as 116.2%, the second dose as much as 10.9% and the third dose as much as 85.21%. However, in the implementation of the vaccination program, there are still pros and cons such as public perception of the presence or absence of Covid-19, vaccine safety, and even anxiety about vaccinating due to several post-vaccination side effects. Based on these problems, it is necessary to analyze the effectiveness of vaccination which affects anxiety levels [3] exposed to the virus based on public knowledge about Covid-19.

The statistical method for examining causal relationships between latent constructs or between latent constructs and indicators is structural equation modeling (*Structural Equation Modeling*) [4], [5], [6], [7]. This method combines regression analysis with factor analysis to solve a model of causal influence equations (*nonrecursive)* as well as mutual influence (*recursive*). SEM is classified into two types namely, *Covariance- Based* SEM is a covariance-based SEM that is used to confirm theories and *Variance- Based* SEM is a variant-based SEM that is utilized to prediction model. Some studies have been conducted on the effectiveness of vaccination, but have not used variant-based structural equation modeling (SEM-*Partial Least Square*). Research on public perceptions of Covid-19 vaccination has been conducted by Lebang [8] in Malalayang District, Manado City with univariate data analysis techniques on respondents who have not and have received Covid-19 vaccination. The study shows the perception of Covid-19 vaccination where people who have not received vaccination have sufficient perceptions with a percentage of 37.9%, while people who have received

vaccinations have good and unfavorable perceptions, each with a percentage of 42.9%. In conclusion, among people who have received the Covid-19 vaccination, not all people have a positive opinion about the vaccination program that has been implemented. Kholidiyah [9] conducted a study in Glagah District, Lamongan Regency where the perception of vaccines as an independent variable and anxiety when going to vaccinate as the dependent variable. Data analysis using SPSS based on contingency coefficient test with the conclusion of anxiety during the vaccination process correlated with public perception of the Covid-19 vaccine.

According to the explanation given above, the study was conducted to determine public perceptions about the effectiveness of vaccination against the level of anxiety exposed to Covid-19 in Bali Province using the variant-based SEM method (SEM-PLS).

II. METHODS

This study used questionnaires as a research instrument to collect primary data. The respondents of the study were Balinese people in each district/city who had received vaccinations. Sampling using accidental sampling and calculation of the number of respondents based on proportions in each district / city throughout Bali using proportional stratified random sampling techniques.

The research variables include independent latent variables in the form of public knowledge about Covid-19 ($\xi 1$), mediating latent variables in the form of vaccination effectiveness ($\eta 1$), and dependent latent variables in the form of public anxiety exposed to Covid-19 ($\eta 2$).

The following steps consist of data analysis methods with the help of SmartPLS 4 software: [10]

1. Identify latent variables and research indicators according to existing theories.
2. Compile a questionnaire with the best sentences.
3. The validity and reliability of the research questionnaire were examined using 30 first responders. The validity test is calculated using the product moment correlation formula, and the reliability test is calculated using the Cronbach alpha value.
4. Collecting data through filling out questionnaires by actual respondents
5. Conduct *a Structural Equation Modeling* (SEM) analysis, with the following stages: i) Create measurement models and structural models, ii) Create a path chart, iii) Convert path diagrams to systems of equations, iv) Evaluate the *inner model* and *outer model*, v) Testing hypotheses through the bootstrapping process, vi) Interpretation of results and conclusions.

III. RESULT AND DISCUSSION

The respondents in this study were people who had received vaccinations in nine regencies/cities in Bali. The characteristics of respondents are based on gender, age, and education. There are 53 percent of male respondents, with the most age being in the range of 18-30 years, and most have the highest high school education.

Research questionnaires must be evaluated first before being used as a data collection instrument, namely by conducting validity and reliability tests. The results of testing the validity and reliability of the questionnaire in this study showed that there were several invalid statements so that these items needed to be eliminated. After all items are valid and reliable, the questionnaire can be distributed to actual respondents.

The first step in conducting an SEM analysis is to test the outer model, this test aims to examine the causal relationship between latent variables and indicators. According to Hair, *et al*. (2014) *outer model* is evaluated based on the nature of the indicator, so that reflective indicators in this study are evaluated based on the values of *convergent validity, discriminant validity* and *composite reliability*.

1. *Convergent Validity*

Convergent validity is a test that is assessed based on the correlation between *the component* score and *the construct score*. The *loading factor value* is said to be sufficient when 0.7. ≥ *Convergent validity* at the indicator level (*loading factor*) must meet this minimum value. The results obtained are as follows:

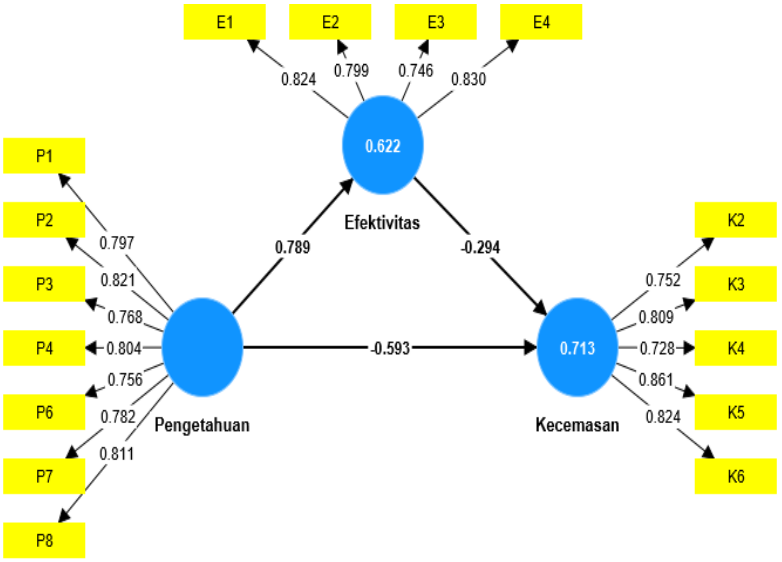

Figure 1. ***Outer Model Test Results***

The design of this model describes the relationship of indicators with their latent variables. Each latent variable (blue color) has an indicator (yellow color) that it points to with an arrow.

Loading factor is a value that shows the correlation coefficient between the indicator and the latent variable. It can be seen that *the largest loading factor value* for the latent variable of knowledge is found in the P2 indicator which is 0.821 and the smallest loading factor value is found in the P6 indicator which is 0.756. Then, the largest loading factor value for the latent variable of effectiveness is found in the E4 indicator which is 0.830 and the smallest *loading factor value is found in the E3 indicator which is* 0.746. Furthermore, the largest loading factor value for the latent anxiety variable is found in the K5 indicator which is 0.861 and the smallest *loading factor value is found in the K4 indicator which is* 0.728. Thus, the higher the *loading factor*, the better the indicator reflects the latent variable being measured.

The value of the coefficient of determination 0.622 indicates the magnitude of the influence of the exogenous latent variable (knowledge) on the latent variable mediation (effectiveness) and the value of the coefficient of determination 0.713 indicates the magnitude of the influence of the latent variable mediation (effectiveness) on the latent variable endogenous (anxiety). As for the exogenous latent variable (knowledge) does not have a coefficient of determination value because it is not an influenced variable but an influencing variable.

In addition, there is a path coefficient value between knowledge and effectiveness of 0.789. That is, every increase in one unit of knowledge variable can increase effectiveness by 0.789. Then, the value of the path coefficient between knowledge and anxiety is -0.593. That is, each increase in one unit of knowledge variable can reduce anxiety levels by 0.593. And the value of the path coefficient between effectiveness and anxiety was -0.294. That is, every increase in one unit of effectiveness variable can decrease anxiety levels by 0.294.

2. Discriminant Validity

At the indicator level, *discriminant validity* is called *cross loading. Discriminant validity* is assessed based on *cross loading* measurements with constructs or variables. The cross *loading values* can be seen in the following table:

Table 1: Cross Loading Value

	Effectiveness	Anxiety	Knowledge
E1	**0.824**	-0.656	0.738
E2	**0.799**	-0.654	0.666
E3	**0.746**	-0.483	0.491
E4	**0.830**	-0.618	0.593
K2	-0.612	**0.752**	-0.595
K3	-0.596	**0.809**	-0.712
K4	-0.553	**0.728**	-0.612
K5	-0.653	**0.861**	-0.716
K6	-0.616	**0.824**	-0.638
P1	0.586	-0.631	**0.797**
P2	0.610	-0.688	**0.821**

P3	0.549	-0.562	**0.768**
P4	0.568	-0.648	**0.804**
P6	0.667	-0.648	**0.756**
P7	0.687	-0.643	**0.782**
P8	0.683	-0.730	**0.811**

Source: Data processed, 2023

The *cross loading value is the correlation between the construct and the measuring item, where each construct is evaluated to ensure that* the cross loading value for each indicator of each construct is greater than the other construct and has a value of > 0.7. Refer to Table 1. This means that each indicator has met the requirements of the discriminant validity test and is declared valid.

3. Reliability Test

Reliability tests are carried out to determine the level of accuracy, consistency and accuracy of instruments in measuring latent variables. Reliability tests with *composite reability* can be strengthened using *Cronbach's alpha* value. A variable can be considered reliable if it has a *composite reliability value > 0.7 or* Cronbach's alpha value > *0.6.*

Table 2: Reliability Test Results

Variable	***Composite Reliability***	***Crombach's Alpha***	**Information**
Effectiveness	0.877	0.814	Reliable
Anxiety	0.896	0.854	Reliable
Knowledge	0.922	0.901	Reliable

Source: Data processed, 2023

Based on Table 2, each variable has a *composite reliability value of > 0.7 and a value of* Cronbach's alpha > 0.6, so the variable is declared reliable. If the measurement model is valid and reliable, it can proceed to the next stage, namely the evaluation of the structural model (*inner model*).

Inner Model Testing

The structural model (*inner model*) defines the relationship between latent constructs by looking at the estimated value of the parameter coefficient and the level of significance [10]. *The inner model* can be evaluated by looking at the *R-square* for the dependent construct. The higher the *R-square* value, the better the prediction model of the proposed research model.

R-Square is a value that indicates the coefficient of determination of the endogenous variable caused by all exogenous variables connected to it [10]. The R2 value is *divided into three classifications according to Chin (1998), namely*, the R2 value is 0.67, the endogenous latent variable is strongly influenced by the exogenous latent variable, the value of 0.33 R2 < 0.67, the exogenous latent variable *has a moderate effect on the endogenous latent variable, and the value of 0.19 ≤ R2* < 0.33, the exogenous latent variable has a weak influence on ≤ *the endogenous latent variable.* The *R-square value* can be seen in the following table:

Table 3: R-Square value

	R-square	***R-square adjusted***
Effectiveness	0.622	0.620
Anxiety	0.713	0.710

Source: Data processed, 2023

Based on Table 3, the *R-Square* value shows that the effectiveness variable is influenced by knowledge by 62.2% and the anxiety variable is influenced by knowledge by 71.3%. These results show that knowledge about Covid-19 has a moderate influence on vaccination effectiveness and has a strong influence on anxiety.

Test Research Hypothesis

The final step is to test the hypothesis that has been built on this study. The hypothesis used is as follows:

a. The effect of knowledge about Covid-19 on vaccination effectiveness $(\xi_1)(\eta_1)$
   H_0: $\gamma_{11} = 0$ with H_1: $\gamma_{11} \neq 0$
b. The effect of knowledge about Covid-19 on anxiety exposed to Covid-19 $(\xi_1)(\eta_2)$
   H_0: $\gamma_{21} = 0$ with H_1: $\gamma_{21} \neq 0$
c. The effect of vaccination effectiveness on anxiety exposure to Covid-19 $(\eta_1)(\eta_2)$

H_0 $\beta_{21} = 0$ with H_1: $\beta_{21} \neq 0$

d. The influence of knowledge about Covid-19 on anxiety through mediating the effectiveness of vaccination $(\xi_1)(\eta_2)(\eta_1)$

H_0: = 0 $\gamma_{11} = \beta_{21}$ with H_1: $\gamma_{11} \neq \beta_{21} \neq 0$

The following are the results of the hypothesis test through the *bootstrapping* process with significance levels () and t-tables (1.96) as follows: $\alpha = 0.05$

Table 4: Test Research Hypothesis

Causal Relationship	*Original sample (O)*	*Sample mean (M)*	*Standard deviation (STDEV)*	*T statistics (|O/STDEV|)*	*P values*
Knowledge -> Effectiveness	0.789	0.792	0.040	19.675	0.000
Knowledge -> Anxiety	-0.593	-0.599	0.057	10.322	0.000
-> Effectiveness of Anxiety	-0.294	-0.290	0.062	4.716	0.000
Knowledge -> Effectiveness -> Anxiety	-0.232	-0.231	0.053	4.380	0.000

Source: Data processed, 2023

The results obtained based on the hypothesis test table above are as follows:

1. The influence of knowledge on the effectiveness of vaccination
   Knowledge of Covid-19 has a positive effect on the effectiveness of vaccination directly by 0.789. With a *P-Value* value of < α (0.000 < 0.05) or statistical T (19.675) > T table (1.960) it means reject H_0 and accept H_1, so that the relationship between knowledge about Covid-19 and the effectiveness of vaccination is a significant effect. This means that every increase in one unit of knowledge variable can increase vaccination effectiveness by 0.789.
2. The influence of knowledge on anxiety
   Knowledge of Covid-19 negatively affected anxiety levels directly by 0.593. With *a P-Value* value of < α (0.000 < 0.05) or statistical T (10.322) > T table (1.960) means reject H_0 and accept H_1, so the relationship between knowledge about Covid-19 and anxiety is significant. This means that every increase in one unit of knowledge variable can reduce anxiety levels by 0.593.
3. The effect of vaccination effectiveness on anxiety
   The effectiveness of vaccination negatively affected anxiety directly by 0.294. With *a P-Value* value of < α (0.000 < 0.05) or statistical T (4.716) > T table (1.960) means reject H_0 and accept H_1, so the relationship between vaccination effectiveness and anxiety is significant. This means that every increase in one unit of vaccination effectiveness variable can reduce anxiety levels by 0.294.
4. The influence of knowledge on anxiety through mediating the effectiveness of vaccination

Knowledge of Covid-19 negatively affects anxiety indirectly through the effectiveness of vaccination by 0.232. With a *P-Value value* of < α (0.000 < 0.05) or statistical T (4.380) > T table (1.960) means reject H_0 and accept H_1. The results show that the effectiveness of vaccination can have a mediating effect on the influence of knowledge about Covid-19 on anxiety about exposure to Covid-19. This means that every increase in one unit of knowledge variable through mediating the effectiveness of vaccination can reduce anxiety levels by 0.232

IV. CONCLUSION

Most of the 59.6 percent of respondents stated that they carried out job mobility. Some respondents (51.0 percent) stated that they had experienced 1 job change from before the pandemic to during the COVID-19 pandemic. How long does it take to change jobs from the initial job to the next job, 31.8 percent of respondents said they experienced it in less than 6 months, 21.9 percent said they experienced a job change in a period of more than 6 months to 1 year, as many as 6.6 percent said they experienced changing jobs within a period of more than 1 year, while 39.7 percent did not experience job mobility. The type of work of respondents in the tourism sector before the COVID-19 pandemic was found to be 33.8 percent working in accommodation, 25.2 percent in recreation and entertainment, 16.6 percent in food and beverage services, 13.9 percent in transportation, and 10.59 percent in travel services. Respondents' answers regarding employment status before the COVID-19 pandemic were obtained by the majority, namely 90.73 percent of respondents with employee/worker employment status, 5.96 percent with self-employed status (self-employed with unpaid family workers), and 3.31 percent with self-employed status with workers are paid. The employment status of respondents during the COVID-19 pandemic was 45.03 percent with employee/worker status, 38.41 percent with self-employed status (self-

employed with unpaid family workers), 13.25 percent unemployed, and the remainder with self-employed status with temporary workers (0.66 percent) and self-employed with paid workers (2.65 percent).

The association between the job mobility of tourism sector workers and the socio-economic characteristics of respondents shows that there is an association between the presence/absence of job mobility and the variables: 1) gender, 2) level of education, 3) professional education/training held, 4) frequency of experiencing change/ changing jobs from one job to another from before the pandemic to the time of the COVID-19 pandemic, 5) the time span of how long it takes to change jobs from the first job to the next job, and variable 6) changes in income during the COVID-19 pandemic if compared to income before the COVID-19 pandemic.

Based on several research findings above, recommendations for sustainable policies that make it possible to improve the welfare of tourism sector workers so that they can maintain their businesses in similar conditions in the future include: 1) variations in the type of social assistance that is more directed towards business capital assistance that can assisting tourism sector actors affected by the COVID-19 pandemic in creating business opportunities in the informal sector post-pandemic. 2) post-COVID-19 pandemic business recovery program with various empowerment programs facilitated by the government including training, business capital and social assistance for small businesses with the right targets.

Based on the results that have been obtained, the conclusions of this study are as follows:

1. There is a significant influence between knowledge about Covid-19 and the effectiveness of vaccination. This means that good public knowledge about Covid-19 can improve public perception of the effectiveness of vaccination.
2. There is a significant influence between knowledge about Covid-19 and anxiety. This means that good knowledge about Covid-19 can reduce anxiety levels exposed to Covid-19.
3. There is a significant influence between the effectiveness of vaccination and anxiety. This means that the better the public perception of the effectiveness of vaccination, the lower the level of public anxiety exposed to Covid-19.
4. Public perception of the effectiveness of vaccination can have a mediating effect on the relationship between knowledge about Covid-19 and the level of anxiety exposed to Covid-19, especially people in Bali.

REFERENCES

1) Reiter, P.L., Pennell, M.L. & Katz, M.L. (2020). Acceptability of a Covid-19 Vaccine among adults in the United States: How Many people would get vaccinated?. Vaccine, 38 (42), 6500-6507. doi:10.1016/j.vaccine.2020.08.043.
2) Director General of P2P Ministry of Health of the Republic of Indonesia. (2020). *Program Action Plan 2020-2024*. 2(1/May):1-33
3) Annisa, F. D. & Ifdil. (2016). The Concept of Anxiety in Elderly. *Journal of Counselor Science*, 5
4) Chin, W. W. (1998). *The Partial Least Squares Approach to Structural Equation Modeling*. London: Lawrence Erlbaum Associates.
5) Hair, J. F., M. Hult, G., Ringle, C. M., & Sarstedt, M. (2014). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Los Angeles: SAGE publications, Inc.
6) Byrne, B. M. (2016). *Structural Equation Modelling with AMOS* (3rd ed.). New York: Routledge.
7) Irwan, & Idris, A. (2014). Analysis of St. Ructural Equation Modelling and Its Applications. *Journal of Technosciences*, 8(2), 137-151
8) Lebang. (2022). Public Perception of Corona Virus Disease 19 vaccination. *Journal of Public Health*, 11(2), 171-175.
9) Kholidiyah. (2021). The Relationship of Public Perception of Covid-19 Vaccination with Anxiety when Going to Undergo Covid Vaccination-19. *LPPM Dian Husada Nursing Academy*, 14(2).
10) Ghozali. (2015). *Smart PLS 3.0*, 2nd Edition, Universitas Diponegoro, Semarang.