ORIGINAL ARTICLE

Bali Medical Journal (*Bali Med J*) 2020, Volume 9, Number 2: 481-487
P-ISSN.2089-1180, E-ISSN: 2302-2914

Published by DiscoverSys

Analysis of the effect of knowledge, attitude, and skill related to the preparation of doctors in facing industrial revolution 4.0

Ayu Sudiwedani[1*], Gede Sri Darma[1]

ABSTRACT

Backgrounds: Human resource development in terms of the knowledge, attitude, and skills of a doctor is important in a digital era and to face the industrial revolution 4.0. This study aims to analyze the effect of knowledge, attitude, and skills on doctor behavior and the impact of doctor behavior on its readiness in facing the industrial revolution 4.0.

Methods: This study uses descriptive-quantitative methods with regression analysis techniques.

Results: The results of the study based on Regression Weight (γ) show that knowledge has no significant negative effect on behavior; attitude does not have a significant positive impact on behavior; skill does not have a significant positive effect on behavior, and behavior significantly has a positive effect on the readiness of doctors.

Conclusion: The results and discussion show that hospitals can use the structural equation model in analyzing knowledge, attitude, skill, and behavior problems to increase the doctor's readiness, and strengthening the doctor's behavior needs to develop doctors' attitudes and skills.

Keywords: doctors, technology, the industrial revolution

Cite this Article: Sudiwedani, A., Darma, G.S. 2020. Analysis of the effect of knowledge, attitude, and skill related to the preparation of doctors in facing industrial revolution 4.0. *Bali Medical Journal* 9(2): 481-487. DOI: 10.15562/bmj.v9i2.1895

[1]Undiknas University Graduate School

*Corresponding to:
Ayu Sudiwedani; Undiknas University Graduate School,
drgayu88@gmail.com

Received: 2020-07-09
Accepted: 2020-07-29
Published: 2020-08-01

INTRODUCTION

The industrial revolution 4.0 era is a new development period where several technologies, including physical technology, digital technology, and biological technology were the main technology drivers for the industrial revolution 4.0.[1] One aspect that embodies digital technology is the Internet of Things (IoT). The Internet of Things is a powerful driver, which can find, identify, track, and monitor a subject, and even trigger related events in real-time.

The health sector is a sector that takes benefits from the combination of physical, digital, and technological systems. Currently, mobile phones consumer has the potential to transform, not only for their health and medical needs but also for health research. Existing data have been processed conventionally, sometimes encounter problems caused by human error (human error). Thus, it is necessary to create an information support system that processes data effectively and efficiently, to achieve a competitive advantage. The system must be designed to be developed and applied to create a data information system.[2]

Many health care providers, for example, hospitals are exploring the potential of telemedicine. One of the applications of hospital integration systems is electronic prescription (e-prescribing) to be able to make maximum use of technological developments to improve better patient service. One hospital that has implemented a Hospital Integration Management System (SIMARS) in Denpasar is Sanglah Hospital.

Technology development in Sanglah Hospital requires doctors' adaptation to be ready to face a new work model in the future. Human resources development in terms of the knowledge, attitude, and skills of a doctor is very important in preparing this digital era without forgetting the professional ethics of a doctor. Doctors, as human resources at Sanglah Hospital, are at the forefront service. Doctors are required to be able to always work quickly, precisely, safely, friendly, and comfortable in serving patients. The large number of patients handled by doctors at Sanglah Hospital makes doctors not optimally run the SIMARS program. If the input data is carried out by a non-doctor in charge, it can certainly cause fatal errors that result in unwanted events for the patient. According to Kandou et al., the behavior of doctors as human resources in hospital organizations can thus be influenced by the knowledge, attitude, and skills

of doctors themselves in responding to changes in conventional to digital work model.[3]

Thus, this research aims to: 1) Analyzed the knowledge impact on doctor behavior, 2) Analyzed the effect of attitude on doctor behavior, 3) Analyzed the skill impact on doctor behavior, and 4) Analyzing the doctor behavior impact on readiness to face the industrial revolution 4.0

Gibson, Ivancevich, and Donnely in Koesmono suggested that skill is a proficiency that is related to the tasks that are owned and used by someone at the proper time.[4] According to Lian, in Kandou's research, skill (proficiency) is a person's ability to do an activity or job.[3] More about skills, Dunnett's in Kandou's research stated that skill is the capacity needed to carry out a series of tasks that develops from the results of training and experience.[3]

METHODS

The thinking framework is based on a theoretical study, which then forms a research model. This theoretical research model illustrates the causal relationship between variables of knowledge, attitude, skill, behavior, and physician readiness.

From the thinking framework above, three independent variables influence behavior directly. They are knowledge, attitude, and skill. Furthermore, intervening behavior is the variable that directly affects doctor readiness as the dependent variable.

This research is want to find out the causal relationship between variables using a quantitative study with a descriptive and causative associative survey method. This study will identify a causal relationship between variables and predict these relationships and hypothesis testing. This research was conducted at Sanglah Hospital in Denpasar, where the hospital has implemented a Sistem Informasi Manajemen Rumah Sakit (SIMARS) that changed the doctor's working model in serving patients. This study uses quantitative data sourced from the doctor's response at Sanglah Hospital.

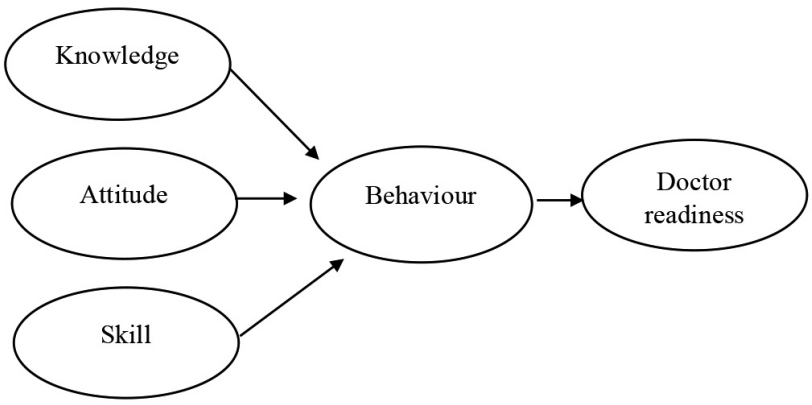

Figure 1. Research framework

The study population was all 368 doctors working at Sanglah Hospital Denpasar. The sample size calculation uses the Slovin formula with a 5% error level. Based on the data of the total population (N) = 368 and the error rate of sample (e) = 5%, the size of the sample size needed in this study was determined, namely:

$$n = \frac{N}{1+N\,(e)^2} \qquad n = \frac{368}{1+368\,(5\%)^2} \qquad n = 193$$

Figure 2. Sample size calculation uses the Slovin formula

Furthermore, the sample was determined using purposive accidental random sampling.

This research used quantitative analysis, including data processing, organizing data, and result finding. Data analyzed use SPSS software and Structural Equation Modeling (SEM) assisted by AMOS software packages. This model is used to see the size of the direct impact of independent variables on the dependent variable.[5]

RESULT AND DISCUSSION

The research result will explain the descriptive analysis, which includes respondent identity description and respondent score description according to the research variable as well as analysis of the impact between variables using SEM AMOS.

Descriptive Analysis

This descriptive analysis was carried out on the respondents' answers related to the characteristics of the 193 respondents and the description of the respondent's answer scores. The answers include two main points, namely: characteristics of respondents and answer scores about knowledge variables (X_1), attitude (X_2), skills (X_3), behavior (Y), and readiness of the doctor (Z), each has three items questionnaire.

a. Description of respondent characteristics based on the doctor's age
   The number of respondents in this study was 193 people; by age classification, there were 147 doctors or 76.2%, including to 26 to 44 years old group, 12 people or 6.2% for ≥ 45 years old group, and nine people or 4.7% for ≤ 25 years old group. Meanwhile, the remaining 25 people or 13.0% did not answer. In other words, it can be stated, mostly the respondents included in 26 to 44 years old group, indicating they had enough experience.
b. Description of the respondent's answer score to the knowledge variable (X_1)
   The questionnaire distributed to 193

Published by DiscoverSys | *Bali Med J* 2020; 9(2): 481-487 | doi: 10.15562/bmj.v9i2.1895

respondents comprised of 3 statement items relating to knowledge, including x1.1, x1.2, and x1.3. Based on the calculation results, the average score of answers about knowledge was about 8.81 out of 10—this indicating that the respondent's knowledge is classified as good or high.

c. Description of the respondent's answer score to the attitude variable (X_2)
The questionnaire distributed to 193 respondents comprised of 3 statement items relating to attitude, including x2.1, x2.2, and x2.3. Based on the calculation results, the average score of answers about attitude was about 8.58 out of 10—this indicating that the respondent's attitude is classified as good or high.

d. Description of the respondent's answer score to the skill variable (X_3)
The questionnaire distributed to 193 respondents comprised of 3 statement items relating to skill, including x3.1, x3.2, and x3.3. Based on the calculation results, the average score of answers about skill was about 8.59 out of 10—this indicating that the respondent's skill is classified as good or high.

e. Description of the respondent's answer score to the behavior variable (Y)
The questionnaire was distributed to 193 respondents that comprised of 3 statement items relating to behavior, including y.1, y.2 and y.3. Based on the calculation results, the average score of answers about doctors' behavior was about 8.65 out of 10—this indicating that the respondent's behavior is classified as good.

f. Description of the respondent's answer score to the doctor's readiness variable (Z)
The questionnaire distributed to 193 respondents comprised of 3 statement items relating to the readiness of doctors, including z.1, z.2, and z.3. Based on the calculation results, the average score of answers about doctors' readiness was about 8.33 out of 10—this indicating that the doctor's readiness is classified as good or high.

SEM analysis

Research on the impact of knowledge, attitude, and skills towards behavior and its impact on doctors' readiness is conducted not to produce a model. Still, it is intended to confirm the hypothesis model through empirical data. The hypothesis model is as described in the thinking framework—meanwhile, empirical data obtained from 193 doctors who worked at Sanglah Hospital as research respondents. The knowledge variable contains three questions. Attitude contains three questions; skill contains three questions, behavior contains three questions, and the doctor's readiness contains three questions. Thus, we obtained respondents' answers about: 193 x (3 + 3 + 3 + 3 + 3) =2,895 answers that tabulated with Microsoft Excel software. The data then processed by the Amos for Windows statistical program version 24.0 for the Normality, CFA test, and impact test using SEM based on the assumptions in Structural Equation Modeling (SEM) to test the model feasibility.

a. Evaluation of SEM Assumptions

Evaluation of SEM assumptions is preceded by an evaluation of normality to determine data normality.

1. Evaluation of data normality
The normality test was performed on each latent variable indicator. Based on the results of the Confirmatory Factor Analysis (CFA) Amos Version 24.0 for Windows program, we found there are no indicators that have c.r for skewness >± 3.00, and there are no indicators that have a value of c.r. > 3.00. Data for all indicators can be stated to have a normal distribution. Due to normality for all indicator data in latent variables have been fulfilled; thus, a parametric test can be continued.
2. Confirmatory Factor Analysis (CFA) Test Results
Based on the processing results of the confirmatory factor to indicators, both in diagram and table form, we found that the Standardized Regression Weight (λ) for all indicators is greater than 0.50 and the coefficient of C.R. greater than 2.00 with a probability value of each indicator is *** smaller than 0.05. From CFA results, it can be stated that all indicators are strong for confirming latent variables. Thus, all these indicators can be included in further analysis.
3. Impact Analysis with SEM
According to 4 hypotheses that have been formulated, the data analysis is carried out using the Structural Equation Modeling (SEM). The hypothesis being tested is:
    a. Hypothesis 1 (H_1): Knowledge has a positive impact on behavior.
    b. Hypothesis 2 (H_2): Attitude has a positive impact on behavior.
    c. Hypothesis 3 (H_3): Skill has a positive impact on behavior.
    d. Hypothesis 4 (H_4): Behavior has a positive impact on doctor readiness.

Referring to this hypothesis, a Full Model Structural Equation Modeling (SEM) analysis is performed; the results are shown in the figure below.

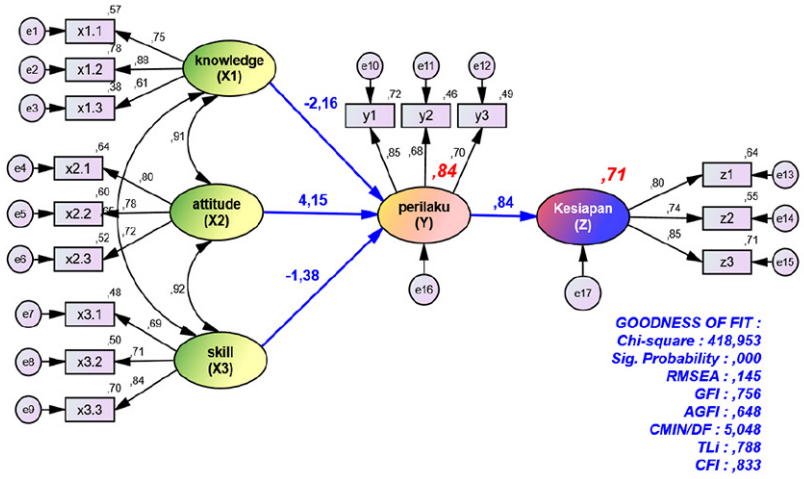

Figure 3. Structural Equation Modeling (SEM) analysis

Based on the figure above, an analysis of measurement models with lambda parameters for the relationship between Knowledge, Attitude, Skill, Behavior with Doctor Readiness, structural model analysis, determination analysis, Goodness of fit analysis can be done.

4. Analysis of Model Measurement Test with Lamda Parameters (λi)
   From the data processing result, we found that all latent variable indicators have a standardized estimate (regression weight) in the form of a loading factor or lambda (λi)> 0.50, a critical value C.R> 2.00 and probability smaller than 0.05 (***). Thus, it can be stated that all of the latent variable indicators are valid/significant.
5. Structural Equation Model Analysis
   Model testing is performed using regression coefficients for Knowledge (X_1), Attitude (X_2), Skill (X_3), Behavior (Y), and Doctor Readiness (Z) variables through table output of the submenu view/set. Based on the calculation results, the regression coefficient (regression weight) and Standardized Regression Weights can be made as output tables as presented in the following.

Regression Weights:

Table 1. **Regression weights (Group number 1 - Default model)**

			Estimate	S.E.	C.R.	P	Label
Y	<---	X_1	-1,925	5,471	-,352	,725	
Y	<---	X_2	4,265	11,782	,362	,717	
Y	<---	X_3	-1,332	6,322	-,211	,833	
Z	<---	Y	,834	,076	10,946	***	

*Knowledge (X_1), Attitude (X_2), Skill (X_3), Behaviour (Y) and Doctor Readiness (Z)

Table 2. **Standardized regression weights (Group number 1 - Default model)**

			Estimate
Y	<---	X_1	-2,164
Y	<---	X_2	4,151
Y	<---	X_3	-1,377
Z	<---	Y	,844

*Knowledge (X_1), Attitude (X_2), Skill (X_3), Behaviour (Y) and Doctor Readiness (Z)

Regarding the standardized estimate for the variables Knowledge (X_1), Attitude (X_2), Skill (X_3), Behavior (Y), and behavior effect (Y) on Doctor Readiness (Z), then structural equation models can be made as follows:

a. The structural equation of X_1, X_2, and X_3 impact on Y
   Impact of X_1, X_2 and X_3 on Y: $Y = \gamma_{y.x1} X1 + \gamma_{y.x2} X2 + \gamma_{y.x3} X3 + e1$
   $Y = -2,164\ X_1 + 4,151\ X_2 - 1,377\ X_3 + e_1$

b. The structural equation Y impact on Z
   Effect of Y on Z: $Z = \gamma_{z.y} Y + e2 = 0.834\ Y + e_2$

From the two tables above, it can be seen that Knowledge (X_1) impact on Behavior (Y) has a standardized estimate (regression weight) of -2,164, with Cr (Critical ratio = identical to the t-count value) of -0.352 at a probability of 0.725. CR value= 0.352 <2,000 and Probability = 0.725> 0.05 indicating that Knowledge variable (X_1) impact on the Behavior variable (Y) is ***negatively insignificant***. This shows Hypothesis 1 (H_1), which stated knowledge has a positive impact on behavior is untested. Thus, it can be stated that the doctor's knowledge does not significantly improve the doctor's behavior. Instead, there is a tendency to decrease the doctor's behavior.

The Attitude (X_2) impact on Behavior (Y) has a standardized estimate (regression weight) of 4.151, with a Cr of 0.362 on a probability of 0.717. CR value = 0.362 <2,000 and Probability = 0.717> 0.05 indicating that the Attitude (X2) variable impact on the Behavior variable (Y) ***positively insignificant***. This shows Hypothesis 2 (H_2), which stated that attitude has a positive impact on behavior is untested. Thus, it can be stated that the doctor's attitude does not significantly improve doctor behavior.

The Skill variable (X_3) impact on the Behavior variable (Y) has a standardized estimate (regression weight) of -1,377, with a Cr of -0,211 on a probability of 0.833. CR value = -0.211 <2,000 and Probability = 0.833> 0.05 shows that the Skill variable (X_3) impact on the Behavior variable (Y) is ***negatively insignificant***. This shows Hypothesis

Published by DiscoverSys | *Bali Med J* 2020; 9(2): 481-487 | doi: 10.15562/bmj.v9i2.1895

3 (H_3), which stated skill has a positive impact on behavior is untested. Thus, it can be stated that a doctor's skill does not significantly improve the doctor's behavior. Instead, there is a tendency for the doctor's behavior to decrease. The Behavior variable (Y) impact on the Doctor Readiness variable (Z) has a standardized estimate (regression weight) of 0.844, with a Cr of 10.946 on probability ***. (Probability *** means less than 0.001). CR value = 10.946> 2,000 and Probability = *** <0.05 indicates that the doctor's Behavior variable (Y) impact on the Doctor's Readiness variable (Z) is significantly positive. This shows Hypothesis 4 (H_4), which stated a doctor's behavior has a positive impact on doctors' readiness is proven. Thus, it can be concluded that doctor behavior can significantly increase doctors' readiness.

6. Analysis of the Measurement Model by Determination

Analysis of the measurement model with determination is used to determine the contribution of exogenous variables toward endogenous variables. Thus, a Square Multiple Correlation is used. The value of Square Multiple Correlation can be seen in the following table.

Table 4. The Goodness of Fit Table evaluation

The Goodness of Fit Index	*Cut-of Value*	Model result	Note
Chi-square (χ^2)	Expected to be small	418,953	Low
Relative Chi-square (χ^2/df)	≤ 2,00	5,048	Low
Probability	> 0,05	0,000	Low
RMSEA	≤ 0,08	0,145	Low
GFI	≥ 0,90	0,756	Low
AGFI	≥ 0,90	0,648	Low
TLI	≥ 0,90	0,788	Low
NFI	> 0,90	0,633	Low

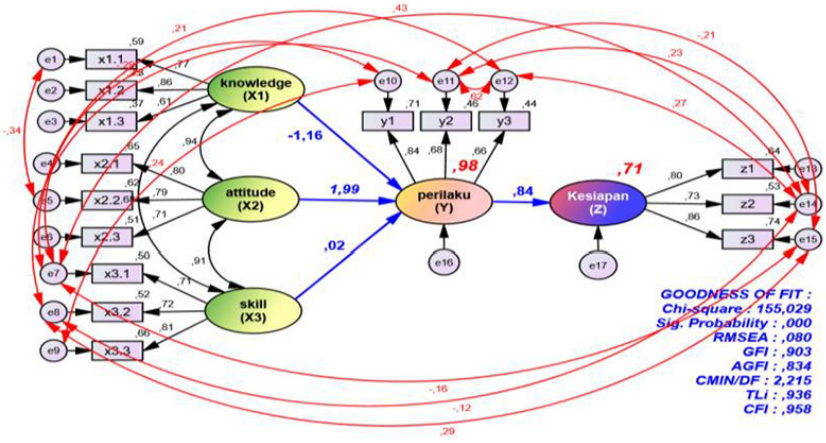

Figure 4. Model modification

Table 3. The value of Square Multiple Correlation (Group number 1 - Default model)

	Estimate
Y	.842
Z	.713

*Behaviour (Y) and Doctor Readiness (Z)

Each square, Multiple Correlation values, was 0.842 for the Behavior variable (Y) and 0.713 for the Doctor Readiness variable (Z), as shown in the table above. Squared Multiple Correlation value for Behavior variable (Y) = 0.842, so the amount of Determination=84.2%. Thus, it can be stated that the behavior change is influenced by Knowledge, Attitude, and Skill as much as 84.2%. Squared Multiple Correlation value for Doctor Readiness variable is 0.713, then the amount of determination = 71.3%. Thus, it can be stated that changes in Doctors' Readiness (Z) are influenced by Behavior (Y) by 71.3%.

7. The Goodness of Fit Analysis

Based on the test criteria, Chi-square (χ2), Relative Chi-square (χ2 / df), RMSEA, GFI, AGFI, TLI, and CFI and the Goodness of Fit, from AMOS for Windows Version 24.0 processing result can be made as to the table below.

Regarding the cut-of-value and Goodness of fit results of the model in the table above, it appears that there are no criteria met the eight criteria that were used. Thus, the above model can be stated as a bad model.[6]

From the above analysis, it can be concluded that all indicators of Knowledge (X_1), Attitude (X_2), Skill (X_3), Behavior (Y), and Doctor Readiness (Z) are valid. From the structural equation model above, which shows Regression Weight (γ), it can be seen that two exogenous variables have a negative relationship, and two exogenous variables have a positive relationship. The Goodness of Fit evaluation results indicates that none has met the criteria. Thus, the model cannot be stated as a good model, and it is necessary to modify the model to improve the model's fitness (Goodness of fit).[6] The Goodness of fit value can be improved by correlating several indicators that have a big Modification Index (M.I.) value or by excluding indicators that have a relatively small λ.[5]

8. Model Modification

This modification model is done by correlating some errors that have big Indices Modification (M.I) coefficients. Modification of the model is done by correlating error that has a Modification Indices (M.I.) value > 10,000 in order to improve the Goodness of fit. After processing the model modification, SEM processing results are obtained, as shown below.

Table 5. Comparison of the Main Model and the Modified Result Model

Goodness of Fit Index	*Cut-of Value*	Main model	Modified model	Note
Chi-square (χ^2)	Expect to be small	418,953	155,029	Better
Relatitive Chi-square (χ^2/df)	≤ 3,00	5,048	2,215*)	Better
Probability	> 0,05	0,000	0,000	Better
RMSEA	≤ 0,08	0,145	0,080*)	Better
GFI	≥ 0,90	0,756	0,903*)	Better
AGFI	≥ 0,90	0,648	0,834+)	Better
TLI	≥ 0,90	0,788	0,936*)	Better
CFI	≥ 0,90	0,833	0,958*)	Better
Y □X1 (γ_{yx1})		-2,164	-1,163	Worse
Y □ X2 (γ_{yx2})		4,151	1,994++)	Better
Y □X3 (γ_{yx3})		-1,337	0,016	Better
Z□Y (γ_{zy})		0,844++)	0,844++)	Still good
Square Multiple Correlation Y		0,842	0,984	Improve
Square Multiple Correlation Z		0,713	0,713	Stagnant

***) Meets Goodness of fit**
+) Marginal
++) Significant
-) Not significant

From the results of the model modification, Goodness of Fit comparison can be done between the main model and the modified model. Comparisons that have been done including Goodness of Fit Coefficient value, Standardization Regression Weight coefficient between endogenous with exogenous variables, and Square Multiple Correlation as a reflection of the coefficient of determination.

Judging from the Goodness of fit, it looks like the modified model shows improvements in all existing indicators. The main model that originally had no Goodness fits indicators fulfilled turns into five indicators that meet the requirements of Relative Chi-square (χ2/df), RMSEA, GFI, TLI, and CFI. Furthermore, from the regression weight of the exogenous variable to the endogenous variable when the model is modified, there is an increase in the three regression coefficients (standardized regression weight). Squared Multiple Correlation seems to increase. From the overall results of the above analysis, it can be stated that by doing a modification model can improve the Goodness of fit model. Since there are already five (more than two) indicators that meet the requirements of Goodness of fit, the model is already good (the good of fit).[6-14]

CONCLUSION

The best model is obtained after modification, by correlating some indicator errors that have an Indication Index (M.I)> 10,000. The structural equation model of modification results can be classified good, because it has fulfilled five criteria out of eight-cut of value they are, Relative Positive Chi-square (χ2/df), RMSEA, GFI, TLI, and CFI. From the structural equation showed by Regression Weight (γ), there are three endogenous variables that have a positive relationship with endogenous variables, and one endogenous variable has a positive relationship with endogenous variables. From the structural calculations showed by Regression Weight (γ), it can be concluded that:

1. The knowledge impact on behavior is negatively insignificant.
2. The attitude impact on behavior is positively insignificant.
3. The skill impact on behavior is positively insignificant.
4. The behavior impact on doctor readiness is positively significant.

Behavior changes are contributed by Knowledge, Attitudes, and Skills by 84.2%, while changes in the doctor readiness are contributed by behaviors by 71.3%.

Sanglah Hospital can use a modification result of a structural analysis model to analyze the knowledge, attitudes, skills, and behavior problems related to doctors' readiness improvement efforts. In addition, in the recruitment process of new doctors at Sanglah Hospital, should be emphasized to their Attitudes and Skills than their knowledge. Last, in an effort to improve the doctors' readiness, behavioral strengthening should be done, which is preceded by improvement in Attitudes and Skills.

CONFLICT OF INTERESTS

There is no competing interest regarding the manuscript.

FUNDING

None.

AUTHOR CONTRIBUTION

All the authors are responsible for the study from the conceptual framework.

REFERENCES

1. Javaid, M. and Haleem, A. Industry 4.0 applications in medical field: A brief review. Current Medicine Research and Practice. 2019.
2. Chute, C. and French, T. Introducing Care 4.0: An Integrated Care Paradigm Built on Industry 4.0 Capabilities. Int. J. Environ. Res. Public Health. 2019; p1-17.
3. Kandou, Yuita L, Victor PK. Lengkong, Greis S. Pengaruh Knowledge Management, Skill dan Attitude Terhadap Kinerja Karyawan (Studi pada PT. Bank Sulutgo Kantor

Pusat di Manado). Jurnal Berkala Ilmiah Efisiensi. 2016; 16:1.
4. Koesmono, T. Pengaruh Faktor Pengembangan Sumber Daya Manusia Terhadap Produktivitas Tenaga Kerja Produksi Pada PT. Siwi. Ekuitas. 2001; 5:4.
5. The Division of Statistic. Structural Equation Modelling (SEM) using AMOS. University of Texas. 2012. p1-52.
6. Li J, Talaei-Khoei A, Seale H, Ray P, MacIntyre C. Health Care Provider Adoption of eHealth: Systematic Literature Review. Interact J Med Res 2013;2(1):e7
7. Manogaran, G., Thota, C., Lopez, D., & Sundarasekar, R. Big Data Security Intelligence for Healthcare Industry 4.0. In L. Cybersecurity for Industry 4.0: Analysis for design and manufacturing. 2017. p103–126.
8. Olok et al. Knowledge and attitudes of doctors towards e-health use in healthcare delivery in government and private hospitals in Northern Uganda: a cross-sectional study. BMC Medical Informatics and Decision Making. 2015. 15:87.
9. Thuan, D et al. A web-based electronic medical records and hospital information system for developing countries. Journal of Health Informatics in Developing Countries. 2011. p155-170.
10. Kennelly SP, Morley D, Coughlan T, Collins R, Rochford M, O'Neill D. Knowledge, skills and attitudes of doctors towards assessing cognition in older patients in the emergency department. Postgrad Med J. 2013;89(1049):137-141.
11. Asem et al. Patient safety: knowledge, influence and attitude among physicians: an exploratory study. Journal of the Egyptian Public Health Association. 2019. 94:22.
12. Brasaite I, Kaunonen M, Suominen T. Healthcare professionals' knowledge, attitudes, and skills regarding patient safety: a systematic literature review. Scand J Caring Sci. 2015;29(1):30–50.
13. Oliveira J, Silva S, Santos P, Matsuda L, Tonini N, Nicola A. Patient safety: knowledge between multiprofessional residents. Einstein (Sao Paulo). 2017;15(1):50–7.
14. Almaramhy H, Al-Shobaili H, El-Hadary K, Dandash K. Knowledge and attitude towards patient safety among a group of undergraduate medical students in Saudi Arabia (Qassim). Int J Health Sci. 2011;5(1):59–67.