Application of Fuzzy Method to Predict Patient's Belief in Doctor Qualifications

Rudiyanto, Ermi Girsang, Ali Napiah Nasution
Faculty of Medical, Universitas Prima Indonesia, Indonesia

Keywords: Patient Confidence, Doctor Qualifications, Prediction, Fuzzy, Modeling.

Abstract: It was found that the majority of hospitals lately tend to experience a decrease in visits, especially at the nursery, presumably because some patients are not sure about the practicing doctor. The aim of this study is to identify factors related to patient belief in practicing doctors. For the data, from 9,919 respondents, 260 samples were used. Data identification using univariate, bivariate with chi-square test, and multivariate with multiple logistic regression at 95% confidence level ($\alpha = 0.05$) were selected. The results of the identification are then modeled using the fuzzy method to predict the patient's confidence in the qualifications of doctors. The design of the independent variable factor relationship model with the dependent variable of 90% is achieved. It is hoped that the results of the model prediction will greatly assist management in making policies. Identification result showed that the factors of doctor reliability, doctor's communication style, and doctor-patient relationship were the most significant factors ($p < 0.05$) in increasing patient confidence in doctors. The dominant variable was found in the doctor-patient relationship (having a weight of confidence in the practicing doctor of 11.1 times higher).

1 INTRODUCTION

An important human resource in a hospital is a doctor. Doctors are not only needed when sick, but also when healthy to prevent illness or maintain and improve the physical and psychological health of a patient. Patients can choose medical services that suit themselves (Setyawan, 2017).

In India, over the past decade, a series of failures in service in the health system, especially in the medical profession, has caused a great lack of trust in hospitals and the medical profession. In many low and middle income countries, the situation is similar and has reached crisis proportions (Kane & Calnan, 2017).

Some important factors that influence the selection of medical services as explained by Shaikh & Hatcher (2004) are: demographic, gender, economic factors, availability of treatment facilities and the severity of the disease. Other factors were also stated by Ahmed (2005), such as; medical costs, education level, ethnicity, age, and distance of the patient's residence from the treatment facility. Sarafino (2006) also added another important factor was the patient's belief or trust.

Hall, Dugan, Zheng, and Mishra (2001) believe that belief is the optimism of the patient in a vulnerable condition where the patient trusts the doctor for the patient's interests. In medical settings, belief or trust can be divided into two forms, namely institutional trust and interpersonal trust. Institutional trust is trust in medical institutions or systems and doctors in general, influenced by the media and institutions related to the health sector, such as the reputation of hospitals, completeness of infrastructure, and others. Whereas what is meant by interpersonal trust is trust in a health provider, such as a doctor who is built through repetition of interactions and expectations about behavior, reliability, kindness (honesty), communication, physical appearance, empathy from a trusted person can be tested from time to time (Hall, Dugan, Zheng, & Mishra, 2001; Pearson & Raeke, 2000).

According to the Indonesian Medical Ethics Honorary Council (MKEK), a doctor tries to cure a patient of his illness and restore his health. One way to cure the disease by a doctor is to cause and strengthen the patient's confidence and belief that he can recover. Turning his attention to things that are hopeful, and optimistic. Psychological / mental state of the patient must be considered so that an

Rudiyanto, ., Girsang, E. and Nasution, A.
Application of Fuzzy Method to Predict Patient's Belief in Doctor Qualifications.
DOI: 10.5220/0010291001180125
In *Proceedings of the International Conference on Health Informatics, Medical, Biological Engineering, and Pharmaceutical (HIMBEP 2020)*, pages 118-125
ISBN: 978-989-758-500-5

explanation of the patient's illness, must be able to generate confidence that the disease can heal or the symptoms of the disease can be reduced (MKEK IDI, 2004).

The relationship between a doctor and a patient is a relationship based on trust, in which the patient places his belief in his doctor that his illness can be cured (Guwandi, 2015). Patients' trust in the services of doctors in hospitals becomes the basis in the ongoing relationship between health care providers with patients. A doctor who has a good track record will attract more patients as consumers because he believes that the doctor has good quality and can be trusted for healing his illness (Soetjiningsih, 2016; Turnip et al, 2020; Wijaya et al, 2019).

The accuracy of the examination carried out by the doctor will affect the level of patient confidence in the reliability of the hospital in providing services. Patients will feel safe and comfortable receiving the services provided if what they receive is as expected (Maksum, Maidin, & Anggareni, 2013). This is consistent with the opinion of Bowers, Swan, & Kochler (2014) states that in looking at the quality of health services mentioned factors that determine the quality of services, namely the ability, skills and knowledge of officers must be in accordance with service providers and doctors who are well trained. This will increase the patient's confidence in the doctor who handles the disease.

Several previous studies that examined the factors that influence patient confidence, Djohan's study (2015) found that the reliability of doctors and perceived benevolence (operational benevolence) had a significant positive effect on the confidence of hospitalized patients in private hospitals in Banjarmasin. Research conducted by Croker et al. (2013) found that belief in the doctor was because the doctor gave the patient enough time, the doctor asked about the symptoms of the patient's illness, the doctor listened to the patient, the doctor explained the examination and treatment, the doctor involved the patient in the decision about treatment, the doctor treated the patient with care and attention and the doctor takes the patient's problem seriously. Another study by Jiang & Street (2017), that patients' trust in doctors positively moderate the relationship between patient activation and doctor-patient communication online, and between perceptions of health status and doctor-patient communication online.

Research conducted by Chandra, Mohammadnezhad, & Ward (2018) on 17 selected articles from electronic databases including PubMed, Hinari, Cochrane, Scopus, and Google Scholar obtained results that in addition to doctor communication skills, interpersonal care levels and knowledge about patient illnesses, respect for patients' illnesses, respect for doctors and care guarantees increase patient confidence or confidence. Another study by Gopichandran & Chetlapalli (2013) in Tamil Nadu, South India found that patients' beliefs or trust in doctors are influenced by doctor behavior, perceived comfort levels, personal involvement with patients, and to a lesser extent by cultural competence and physical appearance doctor. Based on the results of some of these studies indicate that the patient's belief or trust in the doctor is an important concern and need to know what factors influence the patient's belief or trust.

The preliminary survey conducted by researchers interviewed 20 patients who received doctor's services by asking their beliefs / trust about doctors practicing their illness or their families showing as many as 11 people said they were very confident in their ability, 5 people said they were quite sure, and 4 people said they were not sure . Patients who believe in the doctor's practice are caused by good doctor's behavior, friendly, polite communicative. Doctors understand about illnesses suffered by patients and family members. The doctor shows empathy to the patient and looks neat. Conversely, patients who are not sure say that doctors are not friendly, doctors are considered less communicative in explaining illnesses suffered by patients, in addition there are also some who say that they are not satisfied with the answers given by practicing doctors when asked by patients. The patient's beliefs or trust are influenced by several factors that will be the topic of this research.

2 METHOD

This type of research was a quantitative analytic study with a cross sectional study design. This research was conducted at the Stella Maris Hospital in Medan in November 2019. The population of the study was 9,919 people, and the samples were 260 people. The research sampling technique was done by accidental sampling. The sample in this study was a portion of the population whose size was taken using the Lemeshow formula as follows:

$$n = \frac{\left\{Z_{(1-\alpha/2)}\sqrt{Po(1-Po)} + Z_{(1-\beta)}\sqrt{Pa(1-Pa)}\right\}^2}{(Pa-Po)^2}$$

where, n is the sample size, $Z_{(1-\alpha/2)}$ is the standard deviation of the alpha for $\alpha = 0.05 \rightarrow Z\alpha = 1,96$, $Z_{(1-\beta)}$ is the standard deviation of beta for $\beta = 0,10 \rightarrow Z\beta = 1,282$, Po is the proportion of the prevalence of

SC non-medical indications, Pa is the estimated maternal cesarean section without medical indication, Pa-Po is the proportion difference of 0.10. Inclusion criteria used include: Inpatient / Inpatient status the way, get a doctor's service, can communicate well, willing to be a respondent, while the exclusion criteria include not being able to talk (deaf / deaf) and not willing to be a respondent.

Validity test is used to measure the validity of an instrument used, meaning that it is able to reveal what is measured. Validity test was carried out at Sarah Medan General Hospital 30 patients. The test conducted is to determine the correlation between the questions with the total construct score or variable. A construct is declared valid if there is a positive and significant correlation. The correlation value must be greater than 0.361 or the Corrected Indicator-Total Correlation value in the SPSS output greater than 0.361 using the Pearson Product Moment correlation test (Ghozali, 2015). Univariate data analysis, bivariate using chi-square test, and multivariate using multiple logistic regression tests with a confidence level of 95% ($\alpha = 0.05$).

Soft Computing is a new innovation in building intelligent systems. This intelligent system is a system that has expertise like humans in a particular domain, is able to adapt and learn so that it can work better in the event of environmental changes. The basic elements in Soft Computing are: Fuzzy Systems, Artificial Neural Networks, Probabilistic Reasoning, Evolutionary Computing.

Fuzzy systems generally consist of 5 steps in reasoning: Enter fuzzy input, apply the fuzy operator, apply the implication method, the composition of all outputs, and defuzifikasi process. Fuzzy logic is an appropriate way to map an input space into an output space. For very complex systems, the use of fuzzy logic (fuzzy logic) is one solution (Kusumandari et al, 2018; Turnip et al, 2018). In general, fuzzy systems are very suitable for reasoning approaches, especially for systems that deal with problems that are difficult to define using mathematical models. For example, the input values and parameters of a system are less accurate or unclear, making it difficult to define mathematical models.

A membership function is a curve that shows the mapping of data input / output points into their membership values. One method that can be used to get membership values is through the function approach such as triangular, trapesoidal, gaussian, and others. The diagram of fuzzy modeling is shown in Figure 1.

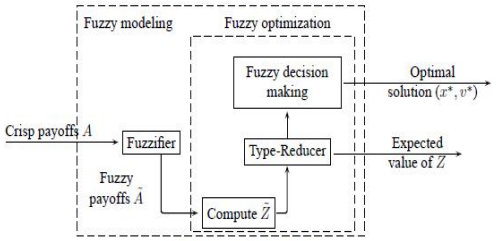

Figure 1: Scheme of Fuzzy Model

If in a fuzzy system there is a fuzzy rule with several inputs, then those inputs can be connected with Zadeh operators, for example AND and OR. When the inputs in the fuzzy rule are connected using the AND operator, the degree of membership of the set of fuzzy outputs is taken from the minimum degree of membership of the inputs. Conversely, if the input operator used is the OR function, then the degree of membership of the fuzzy output set is taken from the maximum membership degree of the input fuzzy set (Turnip et al 2018). Besides being formed based on fuzzy operations on input, the output graph is cut or scaled using the MIN or DOT implication function. Furthermore, decisions can be taken through the defuzzification process.

3 RESULTS AND DISCUSSION

Respondent characteristics include age, sex, last education, occupation, and reason for the visit. Table 1 shows that the majority of respondents aged <43 years (54.6%), a small proportion aged> 43 years (45.4%). Based on gender, all respondents were female (100.0%). Based on education, the majority of respondents were highly educated (diploma / higher) (78.5%), a small proportion were middle educated (high school) (21.5%). Based on work, most respondents work as entrepreneurs / traders (37.7%), a small proportion of respondents work as civil servants (13.0%). Based on the reason for visiting Stella Maris Hospital in Medan, the majority of respondents went to the hospital for treatment (50.8%), a small portion went to the hospital for control (routine check) (49.2%).

Based on the results of the bivariate analysis obtained a significant correlation of independent variables with confidence / trust in lecturers who practice at RSIA Stella Maris in 2019 namely physician behavior (p = 0.003), physician honesty (p = 0.005), physician reliability (p = 0,000), style doctor communication (p = 0,000), doctor empathy (p = 0,000), choice recommendations (p = 0,000), and

doctor-patient relationship (p = 0,000). Unrelated variables are gender (0.879), and education (0.582). The complete Chi-Square statistical test results can be seen in Table 1.

Table 1: Relationship of Each Independent and Dependent Variable.

Variables	Patient's Belief / Trust		*p-value*
	Believe	Unbelieve	
Sex:			
Male	96	27	0,879
Female	109	28	
Education :			
Midle	46	10	0,582
High	159	45	
Doctor Behavior:			
Good	176	37	0,003
Not Good	29	18	
Doctor Honesty:			
Honest	163	33	0,005
Not Honest	42	22	
Doctor reliability:			
Reliable	172	22	0,000
Not Reliable	33	33	
Doctor's Communication Style:			0,000
Communicative	168	31	
Not Communicative	37	24	
Doctor Empathy:			
Empathy	167	31	0,000
Not Empathy	38	24	
Recommended Choice:			0,000
Personally	160	29	
Others	45	26	
Doctor-Patient Relationship:			
Good	170	20	0,000
Not Good	35	35	

The results of multivariate analysis (Table 2) with multiple logistic regression tests showed that from 7 model candidate variables, only 3 variables were associated with patients' beliefs / trust in practicing physicians namely reliability, communication style, and doctor-patient relationship. The most significant variable was the doctor-patient relationship variable which had an Exp (B) / OR value = 11,180 meaning that the patient who stated the doctor's relationship with the patient was good, had confidence in the practicing doctor by 11.1 times higher than the unfavorable one.

Table 2: Multiple Logistic Regression Test Results (Significant).

Variabel	B	Sig.	Exp(B)	95%CI for Exp(B)
Reliability	2,220	0,00	9,207	4,148-20,437
Communication style	1,750	0,00	5,753	2,479-13,349
Doctor-Patient Relationship	2,414	0,00	11,180	4,978-25,106
Constant	-9,979	0,00		

The results of the multiple logistic regression tests also showed variables that were not related to the beliefs / trust of patients in practicing doctors because they had a significant value> 0.05, namely behavior (p = 0.056), honesty (p = 0.110), empathy (p = 0.055) and choice recommendations (p = 0.051). More can be seen in Table 3.

Table 3: Multiple Logistic Regression Test Results (not significant).

No.	Variables	Sig. *(p-value)*
1.	Behaviour	0,056
2.	Honesty	0,110
3.	Empathy	0,055
4.	Recommended Choice	0,051

3.1 Doctor Reliability

The results showed that there was a relationship between physician reliability and patient confidence / trust in the practice physician, p = 0,000 <0.05. Reliability variable that has a value of Exp (B) / OR = 9,207 means that patients who state that doctors have confidence in doctors who practice were 9.2 times higher than less reliable ones.

Based on the assumptions it was found that physician reliability was significantly related to patient confidence / belief. Patients who say that doctors are reliable tend to feel more confident about these doctors than patients who state that doctors were less reliable and feel less sure or lack trust in doctors. The reliability of the doctor in conducting the examination was the key to the patient's confidence. The reliability of doctors was also judged by the doctor's rapid response in providing services to patients. In addition, doctors also show readiness to always serve patients, because by providing the services that patients want, patients will be satisfied and confident of the services they receive from doctors. To increase patient confidence, doctors must also explain in detail if there are questions raised by patients. Patients' beliefs also get stronger when the doctor states there is always for the patient.

3.2 Communication Style

The relationship between doctor's communication style and patient's belief / trust was found, p = 0,000 <0.05. The doctor communication style variable that has the value Exp (B) / OR = 5.753 means that patients who declare communicative doctors have confidence in doctors who practice 5.7 times higher than those who are less communicative.

Communication in the process of history taking is not only done to the patient (auto history taking), but also to other people who know the patient's disease history. A significant contribution of the communication process in the doctor's history to the patient shows that communication skills were an absolute requirement for a doctor to get complete information about the symptoms experienced by the patient. If a doctor is unable to carry out the communication process, this inability can result in an inaccurate diagnosis that is made because information cannot be extracted from the patient. Communication delivered in a style that is easy to understand, polite, relaxed will make it easier for patients to understand what is delivered by the doctor. Improving the communication skills of doctors in hospitals must also be a concern of hospital management because by establishing good communication between doctors and patients will be able to create a comfortable atmosphere and will arise mutual trust, mutual respect and respect.

According to the researchers' assumptions, this study proves that the doctor's communication style was related to the patient's belief / trust. Patients who state that the doctor has a communicative style of communication tend to believe in the doctor. The communication style of the doctor was related to the style of speaking in a clear voice. When communicating, provide information to patients and always smile. Doctors also use language that is easily understood by patients so that patients feel confident that the information provided adds to the knowledge and insight of patients about the disease they are experiencing. Doctors also act interactively by inviting patients to ask things that are not understood or not understood.

3.3 Doctor-Patient Relationship

Based on the results of the study showed that there was a doctor-patient relationship with the patient's belief / trust in the doctor, p = 0,000 <0.05. The doctor-patient relationship variable that has an Exp value (B) / OR = 11.180 means that the patient who states that the doctor-patient relationship is good, has confidence in the doctor practicing 11.1 times higher than the unfavorable one.

In principle, in the relationship between doctors and patients there are two important things that must be considered, namely how doctors place patient autonomy as individuals, especially in making medical decisions and how doctors build harmony through effective communication. During this time doctors put themselves in medical decisions as a guardian and the most versatile, so that patient autonomy has less place.

The results of this study prove that the patient's doctor relationship is significantly related to the patient's confidence in the doctor. Patients who state that a good relationship between the doctor and the patient makes them believe and trust with the doctor. According to the majority of respondents surveyed stated that patients feel familiar with doctors who examine them especially those who often seek treatment. This makes the patient feel comfortable and close to the doctor so that patients do not hesitate to ask questions related to the disease they are experiencing. The closeness of the doctor and patient is caused by the doctor often giving input when the patient confides about his health condition.

3.4. Fuzzy Model

After the formation of the fuzzy set, the fuzzy rules are formed. Rules were formed to state the relation between input and output. Each rule was an implication. The operator used to connect between the two inputs is the AND operator, and the one mapping the input-output is IF-THEN. Propositions that follow IF are called antecedents, while propositions that follow THEN are called consistent. The following are 15 out of 80 built rules in the model design were:

[R1] IF Behavior is SD AND Honesty is SD AND Reliability is SD AND Communication style is SD AND Emapti is SD AND Recommended Choice is SD AND Patient Doctor Relationship is SD THEN Patient Confidence in Doctors is SD.

[R2] IF Behavior is SA AND Honesty is A AND Reliability is A AND Communication Style is SA AND Emapti is A AND Recommended Choice is A AND Patient Doctor Relationship is SA THEN Patient Confidence in Doctors is A.

[R3] IF Behavior is A AND Honesty is A AND Reliability is A AND Communication Style is SA AND Emapti is A AND Recommended Choice is D AND Patient Doctor Relationship is SA THEN Patient Confidence in Doctors is A.

[R4] IF Behavior is A AND Honesty is D AND Reliability is D AND Communication style is A AND Emapti is SD AND Recommended Choice is D AND

Patient Doctor Relationship is A THEN Patient Confidence in Doctors is A.
[R5] IF Behavior is A AND Honesty is D AND Reliability is SA AND Communication style is D AND Emapti is A AND Recommended Choice is SA AND Patient Doctor Relationship is A THEN Patient Confidence in Doctors is A.
[R6] IF Behavior is D AND Honesty is SA AND Reliability is A AND Communication style is A AND Emapti is D AND Recommended Choice is D AND Patient Doctor Relationship is D THEN Patient Confidence in Doctors is D.
[R7] IF Behavior is A AND Honesty is A AND Reliability is D AND Communication style is SA AND Emapti is A AND Recommended Choice is A AND Patient Doctor Relationship is A THEN Patient Confidence in Doctors is A.
[R8] IF Behavior is A AND Honesty is D AND Reliability is D AND Communication style is A AND Emapti is D AND Recommended Choice is A AND Patient Doctor Relationship is D THEN Patient Confidence in Doctors is D.
[R9] IF Behavior is D AND Honesty is SA AND Reliability is A AND Communication style is A AND Emapti is A AND Recommended Choice is A AND Patient Doctor Relationship is SA THEN Patient Confidence in Doctors is A.
[R10] IF Behavior is SA AND Honesty is SA AND Reliability is SA AND Communication style is A AND Emapti is A AND Recommended Choice is A AND Patient Doctor Relationship is A THEN Patient Confidence in Doctors is A.
[R11] IF Behavior is SA AND Honesty is A AND Reliability is D AND Communication style is A AND Emapti is A AND Recommended Choice is SA AND Patient Doctor Relationship is A THEN Patient Confidence in Doctors is A.
[R12] IF Behavior is A AND Honesty is SA AND Reliability is A AND Communication style is A AND Emapti is A AND Recommended Choice is A AND Patient Doctor Relationship is A THEN Patient Confidence in Doctors is SA.
[R13] IF Behavior is A AND Honesty is SA AND Reliability is A AND Communication Style is D AND Emapti is A AND Recommended Choice is D AND Patient Doctor Relationship is A THEN Patient Confidence in Doctors is A.
[R14] IF Behavior is SA AND Honesty is SA AND Reliability is D AND Communication style is A AND Emapti is A AND Recommended Choice is A AND Patient Doctor Relationship is SA THEN Patient Confidence in Doctors is SA.
[R15] IF Behavior is A AND Honesty is A AND Reliability is A AND Communication style is A AND Emapti is SA AND Recommended Choice is A AND Patient Doctor Relationship is SA THEN Patient Confidence in Doctors is SA.
In the rules, SD is strongly disagree, D is disagree, A is agree, SA is strongly agree.

Next up toFor training, 30% of the training data wasused. The input and output design is shown in Figure 2. Fugure 3 is the capture of the 80 built rules on fuzzy. Figure 4 is the surface form of the fuzzy program which shows that if the Behavior value is 12.5 and the Honesty value is 12.5, then the Patient Confidence value is at 25. Data Test results with about 100 data training data are used to test the accuracy of the fuzzy model. Figure 5 is a plot of the measurement data and fuzzy results. From the test results obtained a model with an accuracy of 92.82% (blue is the measured data and orange is fuzzy model results). From Figure 5 it is noted that accuracy decreases from data to 41. This is because the data is the first data recognized by the model. However, the decrease is still not very significant with the meaning that the model still managed to predict patient confidence with an accuracy of 92.82%. Without having to take measurements at any time, the management can predict the level of patient confidence with the next to control the related variables.

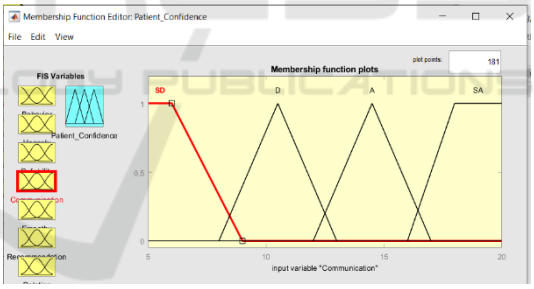

Figure 2: Input and output design.

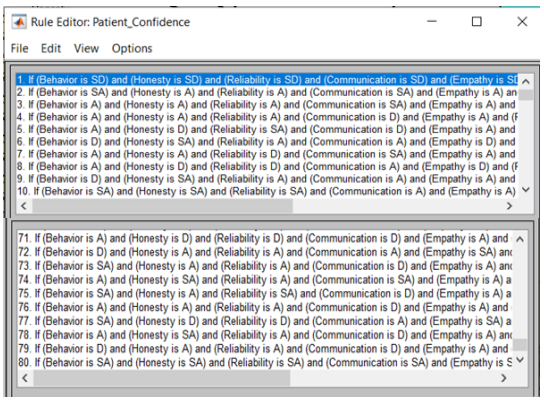

Figure 3: The capture of 80 rules.

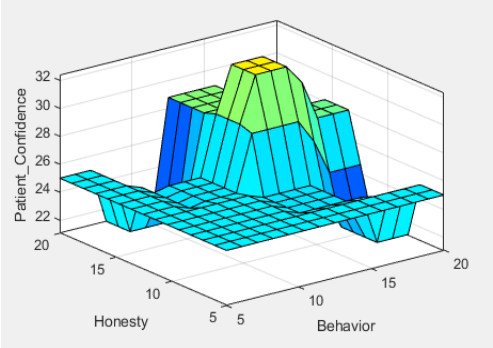

Figure 4: Viewer surface of patient confidence toward honesty and behaviour.

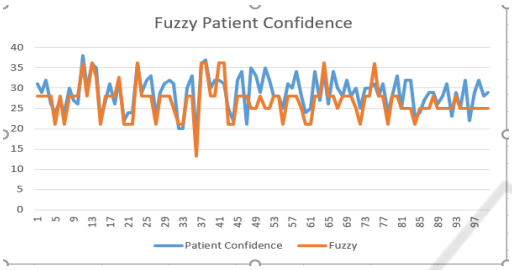

Figure 5: The comparison of patient confidence obtained from fuzzy model toward measured data.

4 CONCLUSIONS

The results showed that reliability, communication style, and doctor-patient relationship were related to the patient's belief / trust in the doctor. The variable with the greatest relationship in this study is the doctor-patient relationship variable which has a value of Exp (B) / OR = 11,180 which mean patients who stated that they had a good relationship with the doctor have an odds of 11,1 times to believe more in their doctor than those who didn't.

REFERENCES

Ahmed, S. M. (2005). Exploring health-seeking behavior of disadvantaged populations in rural Bangladesh. Division of International Health(IHCAR), Department of Health Public Sciences of Karolinska Institutet.

Bowers, M., Swan, J. E., & Kochler, W. F. (2014). What Atibutes Determine Quality and Satisfaction With Health Care Delivery. Health Care Management Review, Aspen Publisher, Inc, 4(1), 49–55.

Chandra, S., Mohammadnezhad, M., & Ward, P. (2018). Trust and Communication in a Doctor- Patient Relationship: A Literature Review. Journal of Healthcare Communications, 03(03), 1–6. https://doi.org/10.4172/2472-1654.100146

Croker, J. E., Swancutt, D. R., Roberts, M. J., Abel, G. A., Roland, M., & Campbell, J. L. (2013). Factors affecting patients' trust and confidence in GPs: Evidence from the English national GP patient survey. BMJ Open, 3(5), e002762. https://doi.org/10.1136/bmjopen-2013-002762

Depkes RI. (2005). Indikator Kinerja Rumah Sakit. Jakarta: Departemen Kesehatan Republik Indonesia.

Djohan, A. J. (2015). Faktor-Faktor yang Mempengaruhi Kepuasan dan Kepercayaan untuk Mencapai Loyalitas Pasien Rawat Inap pada Rumah Sakit Swasta di Kota Banjarmasin. Jurnal Aplikasi Manajemen, 13(2), 257–271.

Goold, S. D. (2012). Trust, distrust and trustworthiness. J Gen Intern Med, 17(1), 79–81.

Gopichandran, V., & Chetlapalli, S. K. (2013). Factors influencing trust in doctors: A community segmentation strategy for quality improvement in healthcare. BMJ Open, 3(1), 1–7.

Guwandi, J. (2015). Hukum Medik (Medical Law). Jakarta: FK Universitas Indonesia.

Hall, M. A., Dugan, E., Zheng, B. Y., & Mishra, A. K. (2001). Trust in physicians and medical institutions: what is it, can it be measured, and does it matter? Milbank Quarterly, 79(6), 13–39.

Hall, M. A., Zheng, B., Dugan, E., Camacho, F., Kidd, K., Mishra, A., & Balkrishnan, R. (2002). Measuring patients' trust in their primary careproviders. Medical Care Research and Review, 59(3), 293–318.

Jiang, S., & Street, R. L. (2017). Factors Influencing Communication with Doctors via the Internet: A Cross-Sectional Analysis of 2014 HINTS Survey. Health Communication, 32(2), 180–188.

Kane, S., & Calnan, M. (2017). Erosion of trust in the medical profession in India: Time for doctors to act. International Journal of Health Policy and Management, 6(1), 5–8.

Kusumandari, D., Risqyawan, M., Yazir, M., Turnip, M., Darma, A. and Turnip, A., 2018. *Application of convolutional neural network classifier for wireless arrhythmia detection*, Journal of Physics: Conference Series, Volume 1080 (2018) 012048 doi: 10.1088/1742-6596/1080/1/012048.

Maksum, W., Maidin, A., & Anggareni, R. (2013). Gambaran Tentang Mutu Pelayanan Dokter Berdasarkan Persepsi Pasien di Instalasi Rawat Jalan Rumah Sakit Universitas Hasanuddin Kota Makassar. Bagian Manajemen Rumah Sakit FKM Universitas Hasanuddin.

MKEK IDI. (2004). Kode Etik Kedokteran Indonesia Dan Pedoman Pelaksanaan Kode Etik Kedokteran Indonesia. Retrieved from https://luk.staff.ugm.ac.id/atur/sehat/Kode-Etik-Kedokteran.pdf

Moordiningsih. (2016). Relasi Psikologis Dokter-Pasien Dalam Layanan Kesehatan : Persepsi, Komunikasi, Empati Dan Unsur Kepercayaan. Psikologika, 22(11), 85–91.

Pearson, S. D., & Raeke, L. H. (2000). Patients' trust in physicians: many theories, fewmeasures, and little data. J Gen Intern Med, 15(1), 509–513.

Rahmulyono. (2015). Konsep Rumah Sakit (Cetakan 1). Jakarta: Gramedia Pustaka Utama.

RSIA Stella Maris. (2019a). Data Laporan Kinerja RSIA Stella Maris Medan Tahun 2017-2018. Medan.

RSIA Stella Maris. (2019b). Data Pegawai dan Kunjungan Rawat Inap di RSIA Stella Maris Medan Tahun 2019. Medan.

Sarafino, E. P. (2006). Health Psychology (5th editio). USA: GTS Companies.

Setyawan, F. E. B. (2017). Komunikasi Medis : Hubungan Dokter - Pasien. BIKKIK FK Unmuh Malang, 1(4), 51–57.

Shaikh, B. T., & Hatcher, J. (2004). Health Seeking Behaviour and Health Service Utilization in Pakistan: Challenging The Policy Makers. Journal of Public Health, 27(1), 49–54.

Soetjiningsih. (2016). Modul Komunikasi Pasien Dengan Dokter (Cetakan 2). Jakarta: EGC.

Supranto. (2015). Pengukuran Tingkat Kepuasan Pelanggan untuk Menaikkan Pangsa Pasar (Cetakan 2). Jakarta: Rineka Cipta.

Thom, D. H., Ribisl, K. M., Stewart, A. L., & Luke, D. A. (1999). Further validation andreliability testing of the trust in physician scale. Medical Care, 37(5), 510–517.

Turnip, A., Andrian, Turnip, M., Dharma, A., Paninsari, D., Nababan, T., Ginting, C.N., 2020. *An application of modified filter algorithm fetal electrocardiogram signals with various subjects*, International Journal of Artificial Intelligence, vol. 18, no., 2020.

Turnip, A., Ilham Rizqywan, M., Kusumandari, D., et al., 2018. *Classification of ECG signal with Support Vector Machine Method for Arrhythmia Detection*, Journal of Physics: Conference Series, Vol. 970 (2018) 012012 doi: 10.1088/1742-6596/970/1/012012.

Turnip, A., Kusumandari, D., Pamungkas, D., 2018. *Drug Abuse Identification based EEG-P300 Amplitude and Latency with Fuzzy Logic Calssifier*, IEEE International Conference on Applied Engineering, (ICAE), 3-4 Oct. 2018, DOI: 10.1109/INCAE.2018.8579378.

Wijaya, C., Andrian, M., Harahap, M., Turnip, A., 2019. *Abnormalities State Detection from P-Wave, QRS Complex, and T-Wave in Noisy ECG*, Journal of Physics: Conference Series, Volume 1230, (2019) 012015. doi:10.1088/1742-6596/1230/1/012015.

Yunanto. (2015). Pertanggungjawaban Dokter Dalam Transaksi Terapeutik (Cetakan 1). Semarang: Universitas Diponegoro Semarang Press.