MEASURING MIDWIVE'S INTENTION TO USE ELECTRONIC INTEGRATED ANTENATAL CARE

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MEASURING MIDWIVE'S INTENTION TO USE ELECTRONIC INTEGRATED ANTENATAL CARE

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ABSTRACT

The Indonesian Maternal Mortality Ratio (MMR) has increased in recent years, from 307 per 100,000 in 2002 to 359 per 100,000 in 2012. This increase happened in spite of improvements over the same period, including in obstetrics care (92%-98%); delivery by healthcare providers (66%-83%); and delivery in health care facilities (40%-63%). Recently, the ANC recorded data are not complete nor accurate so that the data cannot be analyzed to improve the quality of antenatal care. We have developed an electronic integrated ANC record that would enable improving collection of risk screening and other assessment data, provide better access to health information for patients and clients, and facilitate quality assessment and improvement efforts. The Electronic Integrated Antenatal Care (e-iANC) is an innovation to improve mo quality antenatal care data. This study to measure midwives intention to uset e-iANC. Training using e-iANC was held in the computer laboratory to 100 midwives chosen from four primary health care centers in each of five regions. The Technology Acceptance Model (TAM) questionnaire was used to measure midwives intention to use e-iANC. The midwives' midwives intention to use e-iANC was significantly influenced by perceived usefulness and perceived ease of use. TAM results indicated that the factors that might influence attitude towards to use are potentially addressable. Results suggest that e-iANC might well be accepted by midwives.

Keywords: Antenatal Care; Electronic Integrated Antenatal Care (e-iANC); TAM

1. INTRODUCTION

Maternal Mortality Ratio (MMR) in Indonesia is 359 per 100,000 live births (IDHS, 2012) is the highest in Southeast Asia (ASEAN). Singapore 3 per 100,000 live births, Malaysia 5 per 100,000 live births, Thailand 8-10 per 100,000 live births, and Vietnam 50 per 100,000 live birth].

The Millennium Development Goals (MDGs) that is 102 per 100,000 live births in 2015. In 2007 IDHS, M has reached 228 per 100,000 live births, Indonesia has been successful in reducing maternal mortality rate of 390 per 100,000 live births in 1994 and 334 per 100,000 live births in 1997 and 307 per 100,000 live births in 2002. Therefore, MoH RI create a National Action Plan for the Acceleration Decrease Maternal Mortality Rate (RAN-PPAKI) with one program is integrated antenatal care (www.depkes.go. id). Integrated antenatal care is comprehensive and the quality of antenatal care given to all pregnant women at any particular primary health care. The role of primary health care is very important, for spearheading the effort in public health, particularly promotive and preventive [2]. Primary Health Care is also one institution-based data sources in the national health information system (inst tion-based data sources) [3], [4].

An integrated antenatal data is not complete, so that the data can't be analyzed in order to increase the quality of antenatal care [2]. This is consistent with the results of the ANC record evaluation. Records of 42 visits were examined during a single visit to a primary health center in February 2014. Mother Cards were available for only 15(37.5%) of these visits. Of the 15 available Mother Cards, only 5 (33.3%) were recorded in the Mother Cohort. None of the 15 Mother Cards listed the names of the midwives nor health care providers, but 3 (20%) included signatures. Only one of the 15 Mother Cards listed a medical record number, and 11 (73%) had incomplete midwifery information [5].

The quality antenatal care data is important to evaluate the quality of an integrated antenatal care has been done and will automatically have an impact in reducing MMR. Therefore it is necessary to design an electronic integrated antenatal care, called e-iANC.

Electronic Integrated Antenatal Care (e-iANC), in Indonesia we called SIPAT is computer-based information system designed to assist midwives in antenatal care shall record the results of an integrated, include: patient registration; history and physical examination; treatment; diagnosis and follow-up advice service [6].

Technology Acceptance Model (TAM) is a theory to predict and explain the intentions and behavior of the use of information systems. Therefore this study employs it to investigate what impacts midwifes intention to use e-iANC in figure 1 [7].

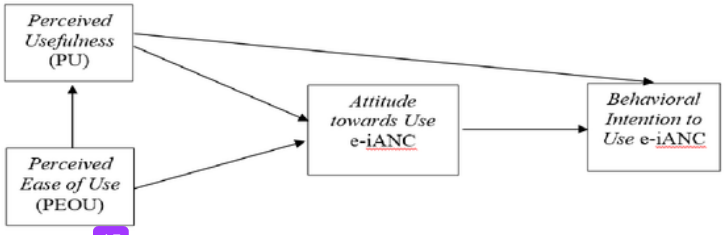

Figure 1. Technology Acceptance Model (TAM)

2. RESEARCH METHOD

This observational analytic research with cross-sectional study design, was conducted in March 2015. The study population was midwives of primary health centers in the province of East Java. Sample of 100 people coming from 20 primary health centers in five districts, namely: Bangkalan; Bondowoso; Lamongan; Malang; Kediri with multistage sampling method, each district was represented by 4 primary health centers.

The questionnaire has been prepared in accordance questions in the original TAM [7], [8]. The response scale for all TAM items was a six-point scale, ranging from 1 (Extremely Unlikely) to 6 (Extremely likely). Before being used in research, the questionnaires was tested for the validity and reliability first. The result showed that the validity and reliability was good (the Cronbach Alpha value was 0.731).

A total 100 questionnaires were distributed which 100% (30 responses) was answered completely and considered as valid ones.

3. RESULTS AND ANALYSIS

The return rate for the questionnaire was 100%. Of the 100 respondents, more than one-third were younger than 30 years of age (37%), 40% were between the ages of 31-40 years of age, 21% were between 41-50, and 2% were older than 50 years of age. Sixty-five percent of respondents had obtained a 3-year diploma, with the remainder having completed a four-year bachelor's degree. Further information is presented in Table 1.

Table 1. The Profile of Respondents

Type of E-IANC		Frequency	Percentage
Age	20-30 years old	37	37.0
	31-40 years old	40	40.0
	41-50 years old	21	21.0
	above 50 years old	2	2.0
	Total	100	100
Education Level	Diploma	65	65
	Bachelor Degree	35	35
	Total	100	100

Construct validity test results with the Smart PLS in measurement model can be seen in the value of Convergent Validity and reliability tests with value of Composite Reliability (CR) and Cronbach's Alpha. In Table 2 the value of the loading factor (Convergent Validity) all construct between 0.728-0.917, it can be explained that almost all indicators of loading factor>0.7. Average Variance Extracted (AVE) > 0.5 (0.684-0.866), it shows that all indicators are valid. CR > 0.7 (0.784-0.927) and Cronbach's Alpha > 0.6 (0.647-0.884). Thus all the constructs, Perceived of Usefulness, Perceived Ease of Use, Attitude Towards to Use e-iANC, Behavioral Intention to Use e-iANC has met the cut-off value of the required and acceptable. This shows the reliability of the measurement model is very good.

Tabel 2. Factor Loadings, Composite Reliability, AVE and Cronbach's Alpha

Constructs	Items	Loadings	Composite Reliability	AVE	Cronbach's Alpha
Perceived of Usefulness (PU)	PU1	0.740	0.882	0.797	0.825
	PU2	0.816			
	PU3	0.876			
	PU4	0.887			
	PU5	0.850			
	PU6	0.798			
Perceived Ease of Use (PEOU)	PEOU1	0.737	0.849	0.684	0.795
	PEOE2	0.769			
	PEOU3	0.832			
	PEOU4	0.771			
	PEOU5	0.733			
	PEOU6	0.728			
Attitude Towards to Use e-iANC (ATU)	ATU1	0.758	0.784	0.866	0.647
	ATU2	0.757			
	ATU3	0.957			
Behavioral Intention to Use e-iANC (BIU)	BIU1	0.897	0.927	0.810	0.884
	BIU2	0.917			
	BIU3	0.886			

After the model being estimated to meet criteria of outer model, then continued to the inner model test. The test results inner model consisted of a coefficient parameter path (path coefficient parameter), the value of R Square (R^2) in Table 3 and Table 4.

The result of path analysis in Table 3 shows that intention to use e-iANC were significantly influenced by Perceived of Usefulness and Attitude towards Use e-iANC (all p-values <0.05). While Perceived Ease of Use indirectly influenced through Perceived of Usefulness and Attitude towards Use e-iANC. Path coefficient parameter and p-values on Perceived of Usefulness (0.932; 0.000) more than Attitude towards Use e-iANC (0.327; 0.038).

Table 3. Path Coefficient of Construct

Direct and indirect influence between endogenous and exogenous variable	Path Coefficient	Sample Mean (M)	Standard Deviation	T Statistics	P-values
Perceived Ease of Use → Perceived Usefulness	0.302	0.315	0.076	3.963	0.000*
Perceived Ease of Use → Attitude towards Use e-iANC	0.313	0.341	0.105	2.983	0.003*
Perceived of Usefulness → Attitude towards Use e-iANC	0.480	0.500	0.062	7.700	0.000*
Perceived of Usefulness → Behavioral Intention to Use e-iANC	0.932	0.918	0.025	38.266	0.000**
Attitude towards Use e-iANC → Behavioral Intention to Use e-iANC	0.327	0.367	0.145	2.967	0.038*

In table 4, R-square intention to use e-iANC amounted 0.587. It meant that the effects of the construct by 0.587 in the category of moderate and almost strong. This showed that the Perceived Ease of Use, Attitude towards Use e-iANC could explain the variance intention to use e-iANC amounted to 58.7% and the remaining 41.3% was influenced by other variables.

Tabel 4. R-Square (R^2)

Constructs	R-square (R^2)
Perceived Ease of Use	0.102
Attitude towards Use e-iANC	0.313
Behavioral Intention to Use e-iANC	0.587

3.1. Perceived of Usefulness

Perceived Ease of Use consists of six indicators: work more quickly, job performance, increase productivity, effectiveness, makes job easier, and useful. Participants responded likely and extremely likely on all of indicator work more quickly, job performance, increase productivity, effectiveness, makes job easier, and useful more than 73%.

Path coefficient of perceived of usefulness affected the intention to use e-iANC by 0.932 and significant t-statistic of 38.266 (>1.96). This can be explained that the perceived of usefulness user e-iANC positive effect on intention to use e-iANC.

Perceived of usefulness positive affected behavior intention, this is in line with previous studies [10], [14]. There was a difference with the results of research an investigation on physician's acceptance of hospital information systems: A case study in China which states that Perceived of usefulness had significant effect on behavior intention [15].

3.2. Perceived Ease of Use

Perceived ease of use is composed of six indicators namely easy of learn, controllable, clear and understandable, flexible, easy to become skillful, and easy to use. Participants responded likely and extremely likely on all of indicator easy of learn, controllable, clear and understandable, flexible, easy to become skillful, and easy use more than 80%.

Effect of perceived ease of use to the intention to use e-iANC indirectly influenced through perceived of usefulness and attitude towards use e-iANC. Effect of perceived ease of use to perceived of usefulness with path coefficient of 0.302 and significant t-statistic of 3.963 (>1.96). Effect of perceived ease of use to attitude towards use e-iANC with path coefficient of 0.313 and significant t-statistic of 2.983 (>1.96). This can be explained the perceived ease of use positive effect on intention to use e-iANC indirectly influenced through perceived of usefulness and attitude towards use e-iANC.

Perceived ease of use affect positively on intention to use e-iANC. The e-iANC user of the primary health centre, this is in line with the theory TAM proposed by Davis et al., 1989. As well as the previous study, the Influence of Affect, Attitude and Usefulness in the Acceptance of Telemedicine Systems. [10], [15]. There is a difference with the results of the Examining Location-Based Services (LBS) Usage from the Perspectives of Unified Theory of Acceptance and Use of Technology and Privacy Risk which stated that the effort expectancy had no significant effect on behavior intention [9]. Modeling the Acceptance of the Clinical Information Systems among medical staff: An extended TAM model.

3.3. Attitude Towards to Use e-iANC

Participants responded likely and extremely likely on all of indicator attitude towards to use e-iANC more than 74%. Attitude towards to use e-iANC positively affected intention to use of e-iANC with path coefficient of 0.327 and significant t-statistic of 2.967 (>1.96). This can be explained empirically that attitude towards to use e-iANC user had positive effect on intention to use e-iANC.

This research line is consistent with results of previous studies on [10], User acceptance of a picture archiving and communication system (PACS) in a Saudi Arabian hospital radiology department which found that attitude towards to use results as positive effect on behavior intention [16], [17], [18].

3.4. Behavioral Intention to Use e-iANC

Behavioral intention to use e-iANC consists of three indicator intend, predict and plan. Behavioral intention to use e-iANC were significantly influenced by perceived of usefulness and attitude towards use e-iANC. Effect of perceived of usefulness to behavioral intention to use e-iANC with path coefficient of 0.932 and significant t-statistic of 38.266 (>1.96). Effect of attitude towards use e-iANC behavioral intention to use e-iANC with path coefficient of 0.327 and significant t-statistic of 2.967 (>1.96). Effect of perceived of usefulness to behavioral intention to use e-iANC more than attitude towards.

The R^2 intention to use e-iANC was 0.587, this could explain that perceived usefulness, perceived ease of use, and attitude towards to use may explain variance intention to use e-iANC amounted to 58.7% and the remaining 41.3% is influenced by other variables.

4. CONCLUSION

Five hypothesis of this study are all accepted and in line with the original theory of TAM. Variance intention to use e-iANC affected by perceived of usefulness, perceived ease of use, and attitude towards use e-iANC. Perceived ease of use indirectly influenced behavioral intention to use e-iANC through perceived of usefulness and attitude towards use e-iANC. Effect of perceived of usefulness has the most powerful among the other construct, it is becoming a major determinant for successful implementation of e-iANC. In order to successfully use e-iANC, midwives need to be introduced to it and to use it directly.

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