

# Factors influencing healthcare workers' perceptions towards comprehensive emergency obstetric and newborn care

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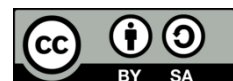
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## ABSTRACT

In tertiary hospitals, comprehensive emergency obstetric and newborn care (CEmONC) provides subspecialty care for high-risk maternal and neonatal emergency cases. Healthcare workers (HCWs) play critical roles in hospital services, and their perception affects the quality of care they provide. Hence, this study was conducted to analyze the factors influencing HCWs' perception regarding CEmONC in a tertiary referral hospital. This cross-sectional study used an electronic questionnaire distributed to 198 CEmONC team members. The sample was selected by convenience sampling, and those who had worked for at least one year were included. The collected data were then analyzed using bivariate and multivariate analysis. Among 119 HCWs, 52.9% had a positive perception towards CEmONC implementation at the hospital. The result of logistic regression analysis found that the significant factors contributing to HCWs' positive perceptions were good knowledge (AOR=33.484;  $p=0.001$ ), good attitude (AOR=55.834;  $p=0.009$ ), high motivation (AOR=12.579;  $p=0.005$ ), high expectations (AOR =27.106;  $p=0.002$ ), and good actual performance (AOR=45.879;  $p=0.003$ ). Age, gender, professional background, and the length of work experience were not associated with HCWs' perceptions ( $p>0.05$ ). Therefore, hospital administrators must regularly evaluate these factors to improve the quality of CEmONC services in the hospital so that maternal and infant mortality rates can be reduced.

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## 1. INTRODUCTION

Reducing the global maternal mortality rate (MMR) to at least 70 deaths per 100,000 live births and the infant mortality rate (IMR) to less than 12 per 1,000 live births by 2030 is one of the Sustainability Development Goals (SDGs) targets [1]. In Indonesia, this target is still far from being achieved, where the MMR is 305 per 100,000 live births, and the IMR is 24 per 1,000 live births [2]. To achieve this target, all hospitals should provide Comprehensive Emergency Obstetric and Newborn Care (CEmONC) services as part of the integrated maternal and neonatal emergency care system [3]. This service must be available within 24 hours, which includes: i) administration of parenteral antibiotics, anticonvulsants, or uterotonics; ii) the manual removal of the placenta; iii) manual vacuum aspiration, dilation or curettage for retained products; iv) assisted vaginal delivery; v) resuscitation for newborns; vi) emergency delivery with a caesarean section; and vii) blood transfusion [3], [4].

Based on the Indonesian National Guideline, the CEmONC program is implemented to prevent maternal and neonatal death, with a different scope of services based on the clinical and management performance standards criteria of each hospital type [3]. A tertiary hospital has higher capabilities in managing complicated cases compared to other lower-level hospitals. This type of hospital must be able to provide subspecialty care for high-risk maternal cases, such as pregnancy with multi-organ failure, which must be handled by a fetomaternal consultant and needs inter-department consultation. In addition, it is also responsible for addressing intensive neonatal care for high-risk newborns, such as critically ill neonates with hemodynamic instability or severe respiratory distress who require advanced life support and are treated under the supervision of a neonatologist [3], [5].

The success of hospital care depends on the performance of the healthcare workers (HCWs) involved in providing the service [6]. Many factors affect performance, one of which is the HCWs' perception of the program implemented in their workplace [7]. One study revealed that the perception of health workers towards the CEmONC services in a hospital is the second most dominating factor influencing their performance quality [8]. Robbins *et al.* [9] stated that perceptions could directly affect employees' participation and commitment, which can further improve their work productivity. Perception is also related to a person's decision-making process and impacts their positive work behavior to achieve the expected goal [10].

In the healthcare setting, HCWs' perception is one of the determinant factors of patient safety culture [11]. By having positive views, adverse medical occurrences could be prevented, and the mortality rate could be reduced [12]. Hence, hospital administrators should consider the health workers' perceptions to improve the quality of patients' care. However, there is no previous study concerning the factors affecting HCWs' perception regarding CEmONC services in the tertiary referral hospital. Therefore, this study was performed to analyze the influencing factors of the HCWs' perceptions towards the implementation of CEmONC services in a tertiary hospital.

## 2. RESEARCH METHOD

This was a cross-sectional study used an electronic, self-administered questionnaire distributed to all healthcare team members involved in providing CEmONC services at a tertiary hospital in Indonesia, with a total population of 198 people. The sample in this study was selected using a convenience sampling method. Those who had work experience for more than one year, agree to participate in this study, and are able to use electronic questionnaire tools were eligible to be included in this survey. A total of 129 participants submitted the questionnaire, of which 119 were included. Meanwhile, ten respondents who had worked as CEmONC team members for less than a year were excluded. This study was approved by the Health Research Ethics Committee of the hospital (Ethical Approval No. LB.02.02/5.7/151/2022).

The questionnaire was prepared by the researchers and validated by two supervisors, and was presented in Bahasa Indonesia to minimize the risk of information bias. This self-developed questionnaire was tested for validity and reliability using Pearson Correlation analysis and Cronbach's alpha method, before being distributed to the participants. In this study, the researchers initially approached the participants with a detailed explanation of research, and they were then asked to fill out an informed consent page before answering the online questionnaire through Google Form (Google LLC, USA). To complete the survey, they must provide personal characteristic data (age, gender, professional background, and the length of work experience), as well as answer a total of twenty questions on five-point Likert scales that were used to assess five variables affecting perceptions, which are: knowledge (6 items), attitude (3 items), motivation (4 items), expectations (4 items), and actual performance (3 items). Furthermore, the perception was measured as the total accumulation of those 20 items in the questionnaire. The online questionnaire was opened from June to July 2022 until data saturation occurred.

In this study, bivariate and multivariate analysis were performed to determine the factors influencing HCWs' perceptions. The data were analyzed using SPSS software version 23.0 (IBM Corp., USA). The categorical data were calculated as frequencies (n) and percentages (%). Variable knowledge, attitude, motivation, expectations and actual performance were measured by calculating the median score as the data were non-normally distributed. If participants scored more than or equal to the median, it was categorized as good/high, whereas if they scored less than the median, it was categorized as poor/low. So is perception; it was categorized as positive if they scored more than the median and negative if they scored less than the median. Bivariate analysis using the Chi-square test was initially conducted, and all variables with a significance level  $p\text{-value} < 0.25$  were further analyzed using binary logistic regression for multivariable analysis. Statistical significance was set at  $p\text{-value} < 0.05$ .

### 3. RESULTS AND DISCUSSION

The subjects' characteristics, as well as the frequency and percentage of each variable, are shown in Table 1. The majority of the participants were 31-40 years (48.7%), female (84.0%), worked as midwives or nurses (70.6%), and had been providing CEmONC services for more than ten years (49.6%).

Table 1. Characteristics of participants (n=119)

Characteristics	Groups	n (%)
Age, years	20-30	23 (19.3)
	31-40	58 (48.7)
	41-50	22 (18.5)
	>50	16 (13.4)
Gender	Male	19 (16.0)
	Female	100 (84.0)
Professional background	Supporting staff	12 (10.1)
	Midwives/Nurses	84 (70.6)
	Non-Consultant doctors	11 (9.2)
	Consultant doctors	12 (10.1)
Length of work, years	1-5	34 (28.6)
	5-10	26 (21.8)
	>10	59 (49.6)
Knowledge	Poor	45 (37.8)
	Good	74 (62.2)
Attitude	Poor	41 (34.5)
	Good	78 (65.5)
Motivation	Low	42 (35.3)
	High	77 (64.7)
Expectations	Low	52 (43.7)
	High	67 (56.3)
Actual Performance	Poor	52 (43.7)
	Good	67 (56.3)

n: frequency

The results of the bivariate analysis are provided in Table 2. The percentage of HCWs with positive perception was higher in the age range 41-50 years than those who aged 31-40 years (72.7% versus 36.2%). In addition, male participants (68.4%) had more positive perceptions than females (50%). Based on occupational characteristics, HCWs who had professional backgrounds as consultant doctors were more likely to positively perceive the CEmONC services implementation at the hospital (OR=1.429; 95% CI 0.271-7.518) than those who worked as supporting staff. Also, HCWs who had work experience for 5-10 years and more than ten years were almost twice more likely to have a positive perception than those who worked for less than five years, with OR 1.948 (95% CI 0.692-5.485) and 1.943 (CI 95% 0.825-4.574) respectively.

In the multivariate analysis, eight variables with p-value of less than 0.25 remained in the regression model, in which the professional background variable was excluded in this step. The Hosmer and Lemeshow Test showed a significance of 0.947, which indicates that the model tested is acceptable goodness of fit. A Nagelkerke R Square of 0.841 means that the eight variables explained 84.1% of the factors influencing HCWs' perception. The Omnibus Tests results obtained a significance p-value (<0.001), so there is a significant simultaneous effect of the remained variables on the HCWs' perception. Based on the partial analysis, five variables were defined as the significant factors influencing HCWs' perception of the CEmONC services at the hospital, which are knowledge (p=0.001), attitude (p=0.009), motivation (p=0.005), expectations (p=0.002), and actual performance (p=0.003). The values of B (beta coefficient), the exponential B/ Exp(B) (adjusted odds ratio/AOR), and the significance, are presented in Table 3.

This study was aimed to analyze the factors influencing healthcare team members' perceptions towards the implementation of CEmONC services at a tertiary hospital. As the highest referral healthcare facility, the hospital must provide 24-hour subspecialty care to handle emergency cases of high-risk maternal and neonatal patients to prevent the death of mothers and newborns [3], [7]. HCWs play critical roles in emergency medical services, and their perception affects the quality of care they provide [7], [13]. Perception is a series of psychological processes in understanding an object, which can be interpreted differently by each individual [14]. In the workplace setting, perceptions could directly affect employees' participation and commitment, which can further improve their work productivity [9], [15].

This study found that only 52.9% of participants positively perceived the implementation of CEmONC services, which indicates that the quality of care provided at the hospital is still not optimal. The analysis found that knowledge, attitude, motivation, expectations, and actual performance were influencing

HCWs' perception, with p-value less than 0.05. These findings add evidence and strengthen previous studies related to the affecting factors of health workers' perception, which previously had been limited in the primary healthcare setting [16].

Table 2. Factors influencing HCWs' perceptions (bivariate analysis)

Variables	Perception		p-value*	Unadjusted OR (95% CI)
	Negative n (%) (n=56)	Positiven (%) (n=63)		
Age				
20-30 years (ref.)	8 (34.8)	15 (65.2)		1.00
31-40 years	37 (63.8)	21 (36.2)	0.021	0.303 (0.110-0.832)
41-50 years	6 (27.3)	16 (72.7)	0.587	1.422 (0.399-5.072)
>50 years	5 (31.2)	11 (68.8)	0.818	1.173 (0.301-4.579)
Gender				
Male (ref.)	6 (31.6)	13 (68.4)		1.00
Female	50 (50)	50 (50)	0.147	0.462 (0.163-1.311)
Professional Background				
Supporting staff (ref.)	5 (41.7)	7 (58.3)		1.00
Midwives/Nurses	40 (47.6)	44 (52.4)	0.700	0.786 (0.231-2.674)
Non-Consultant doctors	7 (63.6)	4 (36.4)	0.296	0.408 (0.076-2.193)
Consultant doctors	4 (33.3)	8 (66.7)	0.674	1.429 (0.271-7.518)
Length of Work				
1-5 years (ref.)	20 (58.8)	14 (41.2)		1.00
5-10 years	11 (42.3)	15 (57.7)	0.207	1.948 (0.692-5.485)
>10 years	25 (42.4)	34 (57.6)	0.128	1.943 (0.825-4.574)
Knowledge				
Poor (ref.)	37 (82.2)	8 (17.8)		1.00
Good	19 (25.7)	55 (74.3)	<0.001	13.388 (5.308-33.771)
Attitude				
Poor (ref.)	37 (90.2)	4 (9.8)		1.00
Good	19 (24.4)	59 (75.6)	<0.001	28.724 (9.060-91.069)
Motivation				
Low (ref.)	32 (76.2)	10 (23.8)		1.00
High	24 (31.2)	53 (68.8)	<0.001	7.067 (2.995-16.672)
Expectations				
Low (ref.)	44 (84.6)	8 (15.4)		1.00
High	12 (17.9)	55 (82.1)	<0.001	25.208 (9.475-67.066)
Actual Performance				
Poor (ref.)	31 (59.6)	21 (40.4)		1.00
Good	25 (37.3)	42 (62.7)	0.017	2.480 (1.180-5.213)

OR=odds ratio; CI=confidence interval; ref.=reference group

\*Chi-square test, all variables with p<0.25 in the bivariate analysis using Chi-square test were included in the multivariate analysis

Table 3. Factors influencing HCWs' perceptions (multivariate analysis)

Characteristic	B	S.E.	Wald	df	p-value†	Adjusted OR	95% CI	
							Lower	Upper
Age	-0.282	0.597	0.224	1	0.636	0.754	0.234	2.430
Gender	0.006	0.997	<0.001	1	0.995	1.006	0.143	7.096
Length of work	0.672	0.764	0.774	1	0.379	1.959	0.438	8.761
Knowledge	3.511	1.027	11.697	1	0.001	33.484	4.477	250.433
Attitude	4.022	1.536	6.857	1	0.009	55.834	2.750	1133.504
Motivation	2.532	0.901	7.903	1	0.005	12.579	2.153	73.501
Expectations	3.300	1.040	10.071	1	0.002	27.106	3.532	208.030
Actual performance	3.826	1.270	9.075	1	0.003	45.879	3.807	552.955
Constant	-28.383	7.123	15.877	1	.000	.000		

B=beta coefficient; S.E.=standard error; df=degree of freedom; OR=odds ratio; CI=confidence interval

†Binary logistic regression test, significant if p <0.05. Eight variables were remained in the multivariate analysis, R<sup>2</sup> =0.841 (Nagelkerke)

The current study revealed that the most important factor affecting healthcare team members' perception was attitudes, with an AOR of 55.834 (95% CI 2.750-1133.504). The attitude of HCWs was assessed by their teamwork behavior, the sense of responsibility, and awareness of their competence in providing the CEmONC services at the hospital. Karademirler *et al.* [17] stated that teamwork among healthcare providers is an essential element in improving patient safety, which is a critical issue in pediatric healthcare services. Basically, it is because the care of a patient does not only require the responsibility of one person but is the responsibility of the entire team of health workers who coordinate with each other [18]. If it is neglected, medical errors can occur, and newborns being the most vulnerable group affected by patient safety incidents [17], [19].

The second most essential factor affecting HCW's perception is the actual performance (AOR=45.879; 95% CI 3.807-552.955), defined as the factual activities of maternal and neonatal service relative to the performance standard. An expert mentioned that experience is closely related to perception, in which a person with a successful experience tends to have a positive perception [20]. In contrast, people will have a negative perception when the expected goal is not achieved.

This study also found that a healthcare professional with good knowledge is about 33 times more likely to perceive the implementation of CEmONC services positively (AOR=33.484; 95% CI 4.477-250.433). This is supported by the result of a previous study that knowledge is the main factor affecting nurses' perception of the triage system, which contributes to their decision-making in providing care for emergency patients [21]. These findings emphasize that being professionally trained is crucial for HCWs to provide better care services [22]. The competence of healthcare professionals has a favorable impact on patient satisfaction [23], which in turn affect patients' trust and clinical outcomes [24]. Thus, the hospital management team should consider the importance of knowledge among CEmONC team members and should provide continuing education to increase HCWs' capacity in handling maternal and neonatal emergency cases [8], [25]. The training can be carried out in collaboration with other institutions or by competent speakers from the hospital [3], [26].

In addition, HCWs' expectation regarding their supporting system was also found to have a strong association with their perception (AOR 27.106; 95% CI 3.532-208.030). The results of this study are also in line with a study conducted by Hanifah *et al.* [27] that there is a relationship between expectations and one's perception, in which individuals with high expectations tend to have good perceptions. Furthermore, the individual's expectation towards positive feedback that they receive will directly affect their performance [28]. Similarly, Kiyici *et al.* [29] revealed that nurses who are highly satisfied with their work environment would focus more on patient care and provide a higher quality of healthcare services.

This study also demonstrated that motivation was significantly correlated to the perception formed by HCWs regarding the hospital healthcare services (AOR 12.579; 95% CI 2.153-73.501). This finding is in line with the study conducted by Madiistriyatno *et al.* [30] that high motivation at the workplace will affect health workers' perceptions so that they will provide excellent service and good work productivity. Also, Aduo-Adjei *et al.* [31] revealed that motivation is key to the work performance of healthcare professional. The quality of the healthcare system is associated with the efficiency and effectiveness of services provided, which depends on HCWs' motivation. Thus, hospital managers should be aware about the importance of providing support for health workers [32]. HCWs' motivation can be boosted when they have close engagement with the managerial team, which will facilitate them to discuss challenges and find possible solutions regarding patients' care [33].

However, this study had several limitations. First, this study used a self-reported questionnaire, in which participants might not fully understand the question and causing information bias. Second, the cross-sectional design used in this study was not an ideal method for determining causal relationships. This study was also only conducted in one hospital in Indonesia, which could not be generalized to the actual situation in all tertiary referral hospitals in the country. Further studies, such as multi-center research with cohort design or direct examinations, are suggested to better acknowledge the relations.

#### 4. CONCLUSION





In conclusion, the influencing factors for HCWs' perception towards the implementation of CEmONC services at a tertiary-level hospital were knowledge, attitude, motivation, expectations, and actual performance. Meanwhile, age, gender, professional background, and the length of work experience were not significantly associated with the HCWs' perception. Therefore, the hospital management team should monitor and evaluate those affecting factors periodically to improve the quality of CEmONC services and can further reduce the maternal and neonatal mortality rate.

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