

# Analyzing the Effect of Organizational Factors on Reducing the Disease Transmission Risk in Nurses using an AIDS Risk Reduction Model

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## Abstract

**Aims:** Nurses are one of the health workers who face a high risk of contracting a disease at their workplace. The officers who are inconsistent in maintaining standard precautions when treating patients render nurses to be exposed to infectious disease. **Settings and Design:** This was an analytic observational study with a longitudinal design. **Materials and Methods:** This study was carried out in two Provincial B Type Government Hospitals, namely, Labuang Baji Provincial Regional Hospital and Makassar Haji Regional General Hospital, in Makassar City, with a sample size of 104 respondents. The data were subjected to ANOVA test to determine the effect of organizational factors on reducing the risk of AIDS risk reduction model-based disease transmission. **Results:** The results of this study indicate that the organizational factors do not affect the labeling of nurses related to the reduction of the risk of disease transmission ( $b = 0.086$ ,  $\rho = 0.379$ ). The organizational factors influence nurses commitment related to the reduction of the risk of disease transmission ( $b = 0.328$ ,  $\rho = <0.001$ ) and also their enactment related to the reduction of the risk of disease transmission ( $b = 0.199$ ,  $\rho = 0.030$ ). **Conclusions:** The organizational factors related to the reduction of the risk of disease transmission affect the action of nurses to reduce the risk (enactment) through the commitment. These organizational factors also affect the labeling of nurses as individuals who are at a risk of contracting a disease so as to facilitate the adoption of a behavior to reduce the risk of disease transmission in hospital.

**Keywords:** Disease transmission, organization, risk reduction behavior

## INTRODUCTION

Nurses are the health workers who play an important role in health services. They suffer a great health risk in Emergency Medical Services under various conditions where officers are not consistent in implementing patient care standards. This is evidenced by the fact that there are still nurses who do not wear gloves (17%), there are still those who do not throw away the contaminated material (19%), there are still those who take out a recapping needle (40%) when using a syringe, and there was an officer who was stabbed with a needle.<sup>[1]</sup> The implementation of standard precaution is still a big problem.

According to Moore *et al.*<sup>[2]</sup>, three important factors could act as inhibitors for health workers in maintaining standard precaution. The construct includes different factors such as individual factors, namely, knowledge, education, attitudes, values, and beliefs; the factors related to work or work environment: experience, skills, workload, work stress, cognitive abilities,

and power; and other factors, such as training, education, communication, supervision, policies, and procedures along with the management commitments for health. Considering these facts, the lack of standard precautions can render nurses to contract with patients. This can be minimized by implementing the AIDS risk reduction model (ARRM).

ARRM was introduced by Catania *et al.*<sup>[3]</sup>, who suggested that the only way to prevent transmission of a disease is to change high-risk behavior. This method is applied to study individual efforts for avoiding transmission of a disease. Although this approach has some weaknesses, it has been proven effectiveness

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in reducing the risk of transmission of HIV/AIDS. This is also expected to reduce the risk of disease transmission to nurses.

The ARRM contains combined elements of both the Health Belief Model (HBM) and social cognitive theory (SCT) and can be used to describe that individual processes affect behavior of patients. HBM was formulated to explain health (preventive) behavior.<sup>[4]</sup> The basic components are based on the hypothesis that the dependent behavior is based on two variables, namely, the desire to avoid illness (or want to recover) and belief that certain health actions will prevent a disease.<sup>[5]</sup> Whereas, the main construction in SCT is self-efficacy and expectations of these results. According to Bandura<sup>[6]</sup>, self-efficacy is an important construct in SCT. The essence of SCT is the assumption that people will act in ways that they believe will produce positive results and avoid the behaviors that they hope can produce unfavorable results.<sup>[7]</sup> Considering this hypothesis, we try to understand why people fail in making behavioral transitions. ARRM is suitable in longitudinal studies to determine why people fail to develop a behavior that will reduce risk. Such understanding will allow for effective interventions because it will be possible to identify people's positions in the change process<sup>[8]</sup> [Figure 1].

The general framework of ARRM is based on a model of psychological problem-solving,<sup>[9]</sup> which is further integrated with HBM elements,<sup>[5,10]</sup> efficacy theory,<sup>[5,11]</sup> emotional influence,<sup>[12,13]</sup> and interpersonal processes.<sup>[14,15]</sup> The RRM includes three stages, namely, labeling, commitment, and enactment.<sup>[16]</sup> The labeling stage means that nurses could be labeled at a high risk of contracting a disease, while carrying out their duties. Once a nurse understands and is aware of the risk of contracting a disease, she will move to the commitment stage to reduce the risk. After the commitment stage is established, it continues to the stage, namely, enactment that consists of three phases: (1) nurses seek information about the ways to reduce risk (information seeking), (2) establish appropriate ways to use it (obtaining remedies), and (3) take action for reducing the risk (taking action) by implementing the standard precautions.

As suggested in ARRM, the factors involved in making a commitment to change high-risk behavior include perceived self-confidence activities.<sup>[17]</sup> The perception of self-confidence can affect the extent to which an individual will be motivated to change the behavior and will try to change.<sup>[18]</sup> The emotional conditions such as anxiety can help an individual to identify risk and increase individual commitment to give up the high-risk behavior.<sup>[19]</sup> However, it is known that in addition to individual factors, organizational factors, especially hospitals, the places where nurses work, also have a very important role in changing these high-risk behaviors. According to Pecquet<sup>[20]</sup>, such organizational factors include workload, supervision ability, policy and standard operational procedure (SOP), and training and availability of facilities summarized in indicators of work safety climate which consist of (a) management commitment, (b) management communication, (c) work safety rules and procedures, (d) work environment, (e) supervision environment, (f) nurse involvement, (g) appreciation of risk, (h) work pressure, and (i)

competency suitability. Organizational factors<sup>[21]</sup> that become a benchmark in this study include the following: [Table 1].

According to the CDC<sup>[22]</sup>, the work safety climate is the perception of nurses regarding safety in a hospital work environment and includes six components, namely, (a) the support of top management (leadership) for work safety programs, (b) the absence of barriers to safe work practices, (c) cleanliness and regularity of the workplace, (d) minimizing communication conflicts between officers, (e) the existence of feedback related to periodic work safety or training by supervisors, and (f) availability of personal protective equipment and engineering control. Thus, it can be concluded that organizational factors related to the reduction of risk of disease transmission are nurses' perceptions of the conditions that are implemented in hospitals; this includes management commitment for risk reduction, management communication, transmission prevention regulations, and procedures, work environment, supervision environment, giving opportunities, and risk appreciation.

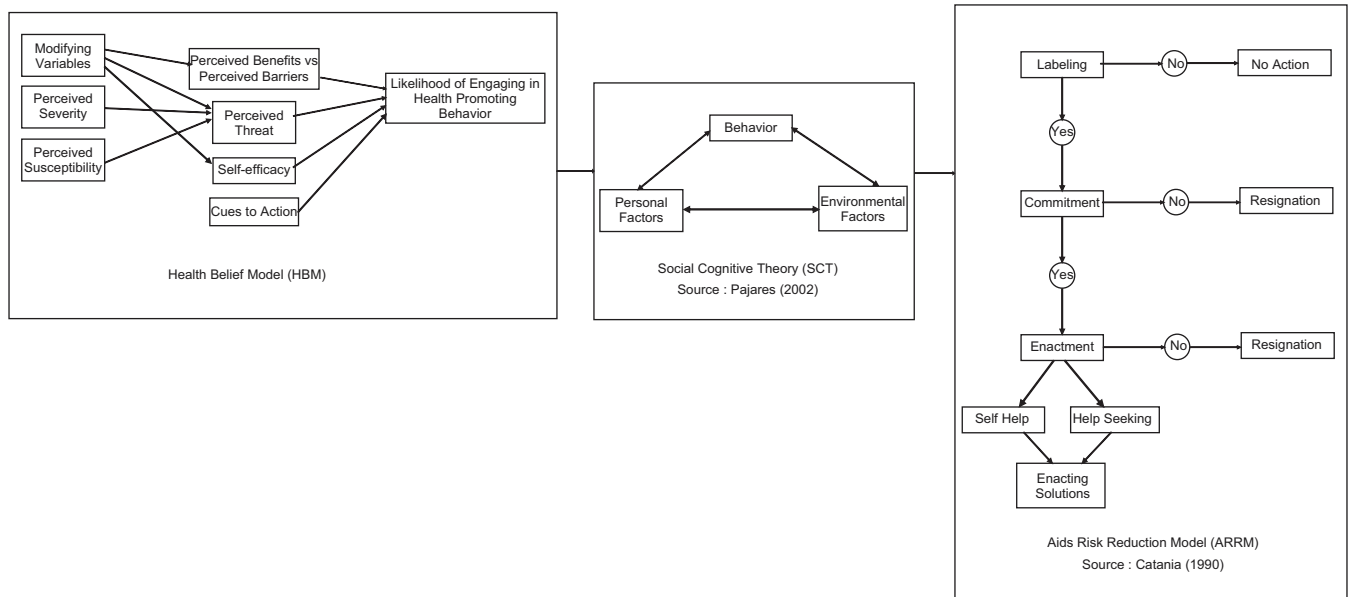
Thus, the purpose of this study was to delineate the influence of organizational factors on reducing the risk of transmission of ARRM-based diseases. If an influence of organizational factors on reducing the risk of transmission of a disease is found, it can be said that the ARRM pattern can be applied to nurses for reducing the risk of contracting various diseases in hospitals.

## MATERIALS AND METHODS

This was an observational analytic study with a longitudinal design. Two Provincial B Type Government Hospitals in the City of Makassar, namely, Regional Provincial Labuang Baji Hospital and Makassar Regional Haji Hospital were considered for the data collection. Both the centers are equal in the clinical standards and policies; this will minimize the differences in facilities and

**Table 1: Organizational factor indicator**

Organizational factor	Indicator
Management commitment	Nurse's perceptions about hospital management decisions in reducing the risk of disease transmission
Management communication	Nurse's perceptions of how management delivers messages related to reducing the risk of transmission
Rules and procedures	Nurse's perceptions regarding the policies and standards set by hospital management related to reducing the risk of disease transmission
Work environment	Nurse's perception of the workplace situation/condition that supports implementing a policy to reduce the risk of transmission
Supervision environment	The supervisor's control situation as felt by nurses in terms of reducing the risk of disease transmission
Giving opportunity	Nurse's perceptions that they have been given an opportunity to convey problems related to reducing the risk of transmission of disease to the management
Appreciation of risk	The feelings of nurse's about management's attention to the risk of transmitting diseases that threaten the health of nurses



**Figure 1:** Differences in the Health Belief Model, social cognitive, and AIDS risk reduction models

health service capabilities, especially the nursing services. The measurements were carried at specific time periods.

The study population included 313 nurses working in Labuang Baji Provincial Hospital and 288 nurses in Makassar Haji Hospital, making a total of 601 participants. A sample size of 86 respondents was determined using the sample size determination software for health studies. Considering the possibility of dropouts and invalid responses, the final sample was increased by 20% as 104 respondents.

The sample size at the two study locations was adjusted to the proportion of the number of nurses available and the calculated sample size. At Labuang Baji Hospital, 55 respondents and at Haji Hospital, 49 respondents were recruited. The samples from the two study locations were considered to identify variations in hospital organization factors and not to make a comparison between the samples hospitals. The judgment sampling technique was used; it recruits subjects by selecting members of a population according to certain criteria.

The independent variables in this study were organizational factors that included seven indicators such as management commitment, management communication, work safety rules and procedures, work environment, supervision environment, providing opportunities, and appreciation for risk. However, these seven indicators do not represent the real organizational factors as all aspects of the organizational factors were not considered. The dependent variable was a reduction in the risk of disease transmission and included labeling, commitment, and enactment. The research instrument was in the form of a questionnaire and observation sheet.

The data were subjected to univariate and bivariate analyses. The univariate analysis of variables was performed to see the percentage frequency distribution. Whereas, the bivariate analysis was conducted to determine the shift of variables

from the first measurement to the second measurement using the paired sample *t*-test and to determine the influence of organizational factor variables on the risk of ARRM-based disease transmission reduction using the ANOVA test.

## RESULTS

Hospital organizational factors are measured by the nurses perceptions of organizational conditions related to the reduction of the risk of disease transmission in hospitals. The assessed organizational factors included management's commitment to prevent transmission, communication for the prevention of transmission, regulations, and procedures for the prevention of transmission, work environment, supervision environment, nurse involvement, and risk appreciation. Nurses' perceptions about the conditions of hospital organization factors showed a subjective picture of the organization in reducing the risk of disease transmission. After collecting the data, a pocketbook, titled "cross-infection sterilization and control (occupational safety and health for health workers)" was given to the respondents as action taken. The handbook is expected to make them aware of the importance of self-protection while working.

Table 2 shows the demographic characteristics, including age, education, and employment, of the respondents. The majority of respondents was in the age group 26–35 years and was female (81.5%). Regarding the last level of education, the majority was (62.2%) having a degree. Table 3 shows that nurses have a better perception of organizational factors related to the reduction of disease transmission. Regarding the first and second measurements, the nurses tended to label themselves at a high risk of contracting a disease. This means that nurses are aware of the magnitude of the risk of the disease transmission while carrying out their duties. The first measurement of nurses indicates that the nurses have a strong commitment to reduce the risk of disease transmission in hospitals. While on

**Table 2: Demographic characteristics of the respondents**

Demographic characteristics	<i>n</i> (%)
Age group (years)	
<26	9 (7.6)
26-35	59 (49.6)
36-45	47 (39.5)
>45	4 (3.4)
Total	119 (100.0)
Gender	
Male	22 (18.5)
Female	97 (81.5)
Total	119 (100.0)
Last education	
S1 nursing	74 (62.2)
Nurse profession	45 (37.8)
Total	119 (100.0)

the second measurement, nurses showed weak commitments in reducing the risk of disease transmission. For the first and second measurement, the nurses showed good enactment for reducing the risk of disease transmission in hospitals.

Table 4 shows that organizational factors have no significant effect on the first and second labeling measurements. The organizational factors, both good and less, do not affect the labeling of nurses as individuals who are at a high risk of contracting a disease. Table 5 shows that the organizational factors have no significant effect on the first commitment. Therefore, both the nurses' perception and perception of the organization related to the reduction of the risk of disease transmission do not affect the nurse's commitment to reduce the risk. In the second commitment measurement, organizational factors showed a significant effect on the nurses' commitment and had a positive contributing influence. The better the nurses' perception of the organizational factors, the strong their commitment to reduce the risk of disease transmission. The greater the lack of perception in nurses about the organizational factors, the weaker is their commitment.

Table 6 shows that organizational factors as an opportunity affecting the commitment of nurses to reduce the risk of disease transmission and exert a positive influence. The nurses who perceive less are given the opportunity to be involved in the risk reduction and tend to have weak commitments, while nurses who perceive the existence of good opportunities to engage in risk reduction tend to have strong commitments.

Table 7 shows that on the first measurement, the organizational factors have no significant effect on the first enactment, thus there are no nurses' perceptions about the organizational factors related to reducing the risk of disease transmission as well as the effect of nurses in reducing the risk. In subsequent measurements, organizational factors showed a significant effect on the enactment of the nurses from both hospitals and had a positive contributing effect. The nurses with less perception about the organizational factors tended to show weak enactment in reducing the risk of disease transmission. The better their perception of organizational factors, the better their enactment in reducing the risk of disease transmission.

**Table 3: Distribution of cognitive elements, organizational factors, labeling, commitment, and enactment in nurses**

Research variable	<i>n</i> (%)
Organizational factors	
Less	57 (47.9)
Good	62 (52.1)
Total	119 (100.0)
First labeling	
Weak	42 (35.3)
Strong	77 (64.7)
Total	119 (100.0)
Second labeling	
Weak	42 (35.3)
Strong	77 (64.7)
Total	119 (100.0)
First commitment	
Weak	17 (14.3)
Strong	102 (85.7)
Total	119 (100.0)
Second commitment	
Weak	61 (51.3)
Strong	58 (48.7)
Total	119 (100.0)
First enactment	
Less	59 (49.6)
Good	60 (50.4)
Total	119 (100.0)
Second enactment	
Less	21 (17.6)
Good	98 (82.4)
Total	119 (100.0)

Table 8 shows that the indicator of organizational factors in the form of risk appreciation has a significant effect on the second enactment of nurses. The nurses, who perceive a lack in the management's appreciation to reduce risks, are less cautious about a risk, while the nurses, who perceive management's appreciation to reduce risks to be good, tend to be good in taking risk reduction measures.

Table 9 shows the results of paired sample *t*-test carried out to determine the changes in the first labeling to the second labeling, the first commitment to the second commitment, and from the first enactment to the second enactment. These results show that from the first labeling to the second one, there is no significant change. From the first commitment to the second one, there is a significant change in the mean value showing that nurses who tend to be strongly committed to the first measurement experienced a change in the mean on the next measurement to be weak in their commitment to reduce the risk of transmission. From the first enactment to the second one, there is a significant change with the mean values indicating that nurses who were less likely to take risk reduction measures at the first measurement experienced a mean change in subsequent measurements to be good in taking action to reduce the risk of disease transmission.

The organizational factor that influences the second commitment is the provision of opportunities. Similarly, the

**Table 4: Effect of organizational factors on the first and second labeling of the nurses related to the reduction of the risk of disease transmission**

Organizational factors	First labeling			Second labeling		
	Weak, <i>n</i> (%)	Strong, <i>n</i> (%)	Total, <i>n</i> (%)	Weak, <i>n</i> (%)	Strong, <i>n</i> (%)	Total, <i>n</i> (%)
Less	18 (31.6)	39 (68.4)	57 (100.0)	21 (36.8)	36 (63.2)	57 (100.0)
Good	24 (38.7)	38 (61.3)	62 (100.0)	21 (33.9)	41 (66.1)	62 (100.0)
Total	42 (35.3)	77 (64.7)	119 (100.0)	42 (35.3)	77 (64.7)	119 (100.0)
<i>B</i>		0.115			0.086	
$\rho$		0.220			0.379	

**Table 5: Effect of organizational factors on the first and second commitments of nurses related to reducing the risk of disease transmission**

Organizational factors	First commitment			Second commitment		
	Weak, <i>n</i> (%)	Strong, <i>n</i> (%)	Total, <i>n</i> (%)	Weak, <i>n</i> (%)	Strong, <i>n</i> (%)	Total, <i>n</i> (%)
Less	6 (10.5)	51 (89.5)	57 (100.0)	36 (63.2)	21 (36.8)	57 (100.0)
Good	11 (17.7)	51 (82.3)	62 (100.0)	25 (40.3)	37 (59.7)	62 (100.0)
Total	17 (14.3)	102 (85.7)	119 (100.0)	61 (51.3)	58 (48.7)	119 (100.0)
<i>B</i>		0.013			0.328	
$\rho$		0.887			<0.001	

**Table 6: Effect of indicators of organizational factors on the second commitment of nurses**

Organizational factor indicator	Second commitment		Total, <i>n</i> (%)	<i>B</i>	$\rho$
	Weak, <i>n</i> (%)	Strong, <i>n</i> (%)			
Management commitment					
Less	29 (56.9)	22 (43.1)	51 (100.0)	0.174	0.131
Good	32 (47.1)	36 (52.9)	68 (100.0)		
Total	61 (51.3)	58 (48.7)	119 (100.0)		
Management communication					
Less	31 (54.4)	26 (45.6)	57 (100.0)	0.091	0.809
Good	30 (48.4)	32 (58.6)	62 (100.0)		
Total	61 (51.3)	58 (48.7)	119 (100.0)		
Rules and procedures					
Less	32 (55.2)	26 (44.8)	58 (100.0)	0.016	0.862
Good	29 (47.5)	32 (52.5)	61 (100.0)		
Total	61 (51.3)	58 (48.7)	119 (100.0)		
Work environment					
Less	34 (58.6)	24 (41.4)	58 (100.0)	0.053	0.570
Good	27 (44.3)	34 (55.7)	61 (100.0)		
Total	61 (51.3)	58 (48.7)	119 (100.0)		
Supervision environment					
Less	30 (58.5)	21 (41.2)	51 (100.0)	0.026	0.837
Good	31 (45.6)	37 (54.4)	68 (100.0)		
Total	61 (51.3)	58 (48.7)	119 (100.0)		
Giving opportunity					
Less	29 (64.4)	16 (35.6)	45 (100.0)	0.324	<0.001
Good	32 (43.2)	42 (56.8)	74 (100.0)		
Total	61 (51.3)	58 (48.7)	119 (100.0)		
Appreciation of risk					
Less	34 (59.6)	23 (40.4)	57 (100.0)	0.161	0.123
Good	27 (43.5)	35 (56.5)	62 (100.0)		
Total	61 (51.3)	58 (48.7)	119 (100.0)		

organizational factor that affects the second enactment is risk appreciation. The organizational factors related to the

reduction of the risk of disease transmission affect the action of reducing the risk of disease transmission (enactment)



**Table 7: Effect of organizational factors on the first and second enactments of nurses related to reducing the risk of disease transmission**

Organizational factors	First enactment			Second enactment		
	Weak, <i>n</i> (%)	Strong, <i>n</i> (%)	Total, <i>n</i> (%)	Weak, <i>n</i> (%)	Strong, <i>n</i> (%)	Total, <i>n</i> (%)
Less	28 (49.1)	29 (50.9)	57 (100.0)	13 (22.8)	44 (77.2)	57 (100.0)
Good	31 (50.0)	31 (50.0)	62 (100.0)	8 (12.9)	54 (87.1)	62 (100.0)
Total	59 (49.6)	60 (50.4)	119 (100.0)	21 (17.6)	98 (82.4)	119 (100.0)
<i>B</i>		0.024			0.199	
<i>ρ</i>		0.796			0.030	

**Table 8: Effect of organizational factor indicators on the second enactment of nurses**

Organizational factor indicator	Second enactment		Total, <i>n</i> (%)	<i>B</i>	<i>ρ</i>
	Weak, <i>n</i> (%)	Strong, <i>n</i> (%)			
Management commitment					
Less	9 (17.6)	42 (82.4)	51 (100.0)	0.035	0.750
Good	12 (17.6)	56 (82.4)	68 (100.0)		
Total	21 (17.6)	98 (82.4)	119 (100.0)		
Management communication					
Less	11 (19.3)	46 (80.7)	57 (100.0)	0.112	0.298
Good	10 (16.1)	52 (83.9)	62 (100.0)		
Total	21 (17.6)	98 (82.4)	119 (100.0)		
Rules and procedures					
Less	13 (22.4)	45 (77.6)	58 (100.0)	0.027	0.772
Good	8 (13.1)	53 (86.9)	61 (100.0)		
Total	21 (17.6)	98 (82.4)	119 (100.0)		
Work environment					
Less	13 (22.4)	45 (77.6)	58 (100.0)	0.044	0.647
Good	8 (13.1)	53 (86.9)	61 (100.0)		
Total	21 (17.6)	98 (82.4)	119 (100.0)		
Supervision environment					
Less	11 (21.6)	40 (78.4)	51 (100.0)	0.011	0.923
Good	10 (14.7)	58 (85.3)	68 (100.0)		
Total	21 (17.6)	98 (82.4)	119 (100.0)		
Giving opportunity					
Less	9 (20.0)	36 (80.0)	45 (100.0)	0.056	0.609
Good	12 (16.2)	62 (83.8)	74 (100.0)		
Total	21 (17.6)	98 (82.4)	119 (100.0)		
Appreciation of risk					
Less	11 (19.3)	46 (80.7)	57 (100.0)	0.215	0.019
Good	10 (16.1)	52 (83.9)	62 (100.0)		
Total	21 (17.6)	98 (82.4)	119 (100.0)		

through the commitment of nurses to reduce the risk of disease transmission. The organizational factors related to reducing the risk of disease transmission affect self-justification and labeling of the nurses as individuals who are at a risk of contracting a disease so as to facilitate the adoption of behaviors to reduce the risk of disease transmission in hospitals.

## DISCUSSION

The organizational factors showed no effect on labeling the first and second measurements. This means that both organizational factors and the lack of labeling of nurses as individuals, who are at a high risk of contracting the disease, had no effect. This result

is supported by the opinion of Catania *et al.*<sup>[3]</sup>, who suggest that labeling is influenced by individual factors such as knowledge about transmission but not by organizational factors.

Henderson<sup>[23]</sup> argues that nurses do follow standard precautions and perception has a very important role because it is needed to influence health workers. They have an intention to seek information on standard precautions and finally adhere to these precautions.<sup>[24]</sup> The results of this study have implications for factors that do not affect the labeling of nurses.

According to Pasman<sup>[25]</sup>, labels can function as a person's self-justification if their behavior is not socially acceptable.

**Table 9: Changes in labeling, commitment, and enactment from the first to third measurements**

Variable	Mean	T (i-test)	$\rho$
Pair 1			
First labeling	19.45	0.479	0.633
Second labeling	19.83		
Pair 2			
First commitment	6.78	7.457	<0.001
Second commitment	5.57		
Pair 3			
First enactment	57.33	10.962	<0.001
Second enactment	80.85		

This makes possible for someone to blame outside interference rather than his own weakness. Labeling has a positive effect that can help someone to seek self-justification when someone does an action that is not acceptable to the social environment.

This study is in line with that of Lemert<sup>[26]</sup>, which found that self-justification arises because of drug addiction, economic and social disorders, and intense intellectual processes at work related to labeling. This is a subjective motive that causes a person to use drugs. When a person starts a deviant behavior, self-justification is used as a defense from attacks or adjustments to the problems that occur. Thus, it can be inferred from this study that there are still nurses who have weak labeling, do not consider all patients at a high risk of transmitting the disease even though they have not been diagnosed.

The organizational factors are based on their influence on the first and second commitments. The results show that the organizational factors have on the effect on the first commitment, it is not apparent whether the nurses' perception on the organizational factors related to the reduction of the risk of disease transmission affects their commitment to reduce the risk of disease transmission. However, at the next measurement, the organizational factors do influence the nurses' commitment and have a positive contributing influence. The better the nurses' perception of the organizational factors, the stronger is their commitment to reduce the risk of disease transmission.

This is because good organizational factors can increase the motivation, compliance, and interest of nurses in work, which brings comfort and increases commitment to reduce the risk of disease transmission. The more the nurses lack perception of the organizational factors, the weaker is their commitment. This increases the risk of contracting a disease. It is better if the organizational factors are not well oriented to reduced risk; the nurses respond wisely and take the initiative to strongly commit to protect themselves from disease transmission.

Staw<sup>[27]</sup> found that in the context of organizational behavior, commitment is influenced by personal responsibility and resources. Therefore, when we consider indicators of organizational factors, what influences the commitment of nurses is the provision of opportunities. Giving opportunities has a positive contribution. The nurses who are not given the

opportunity to be involved in risk reduction process tend to have weak commitments, while the nurses who perceive good opportunities to engage in risk reduction tend to have a strong commitment. Among the effects of organizational structures on different occupational groups, nurses' commitment was affected to be a greater extent than physicians' commitment by a higher degree of organizational autonomy in decision-making work, scheduling, and work methods.<sup>[28,29]</sup>

The nurses' perceptions regarding the provision of opportunities include: (1) 51.3% of nurses agree that management involves nurses in making decisions related to the prevention of disease transmission; (2) 53.8% of nurses agree that their supervisors require them to play an active role in identifying factors that can increase the risk of contracting a disease; (3) 52.1% of nurses agree that their supervisors require them to report accidents, incidents, and situations of being affected or contracting a disease; (4) 56.3% of nurses agree that employers always ask them to participate in planning the prevention of disease transmission in the workplace; and (5) 54.6% of nurses agree that supervisors give them the responsibility to minimize the risk of disease transmission.

Nurses also perceive that good organizational factors sometimes do not work consistently. This is because the improvement and care of management are high if the hospital is in the process of assessment or accreditation, but after the accreditation process is complete, management's attention is reduced. According to the contribution and commitment to work by employees depend on their satisfaction with the facilities provided by the management. This is the reason why nurses show weak commitment if they perceive that organizational factors are not sufficient in reducing the risk of disease transmission. Liu *et al.*<sup>[30]</sup> concluded that improvement in nurses' work environments, increasing nurses staffing levels, and providing sufficient support to them for devoting more time to direct patient care activities could help in reducing professional exhaustion in nurses, thereby promoting patient safety.

The research conducted by Ruruk *et al.*<sup>[31]</sup>, suggests that the commitment of nurses in carrying out the risk reduction measures of disease transmission ( $\rho = 0.041$ ) is influenced by management commitment in the hospital. These results are in line with several other studies that link organizational factors to commitments with different factors. Sari and Bodroastuti<sup>[32]</sup> also argued that organizational factors have a positive influence on organizational commitment. Therefore, workers (nurses) depend on what is provided by the organization and depending on that they can strengthen their internal encouragement such as perceptions of losses and the benefits of safe behavior to reduce the risk of disease transmission.

The organizational factors were observed to have an effect on the first and second enactments. The results showed that at the first measurement, organizational factors had no effect on the first enactment so that both the nurses' perception and perception of organizational factors related to the reduction of the risk of disease transmission did not have an effect on the

enactment of nurses in reducing the risk of disease transmission. In subsequent measurements, the organizational factors showed an influence on the enactment of the nurses and had a positive contributing effect. The fewer perception nurses have about the organizational factors, the less enactment they have in reducing the risk of disease transmission. This is because nurses feel that they do not get appreciation from management. The better the nurses' perception of organizational factors, the better is their enactment in reducing the risk of disease transmission.

When viewed from the indicator of organizational factors, the appreciation of risk affects the enactment. The nurses, who perceive the lack of management's appreciation for a risk, tend to be less cautious toward the risk. The nurses, who perceive management's appreciation of risks to be good, tend to be good at taking the risk the reduction measures. This shows that if management gives attention to risks that threaten the health of nurses, they will be better at taking risk reduction measures because they are aware of the magnitude of the risk of disease and risk reduction supported by management.

The nurses' perceptions regarding risk appreciation are as follows: (1) 35.3% of nurses agree that management does not schedule vaccinations regularly; (2) 30.3% of nurses agree that there is no reward when they always work according to SOPs; (3) 39.5% of nurses agree that their supervisors always emphasize that personal safety is a top priority; (4) 37% of nurses agreed that the hospital does not provide free medical checkup programs for nurses; and (5) 32.8% of nurses agree that their supervisors always praise if they protect themselves from the risk of an illness. The data show that the nurses perception is not good regarding the risk appreciation given by the management, thus they do not take action to reduce the risk of disease transmission in the hospital.

The enactment phase is carried out by the nurses in the three steps: starting from seeking information related to risk reduction, determining solutions to the problems that have been identified and the applying the solutions that have been determined in reducing the risk of disease transmission. However, the theory proposed by Kahneman and Tversky<sup>[33]</sup> shows that individual behavior is positive in avoiding risk when expecting positive solutions and negative when expecting negative solutions. This shows that the time frame is very important in determining a solution that will affect the behavior displayed when responding to risk.

Mark *et al.*<sup>[34]</sup>, suggested that hospital nurses might have a high level of injury. However, the approach to improve the safety of nurses is more focused on efforts to change individual behavior through compliance, enforcement of safety regulations, and the obligation to participate in workplace safety training. The results of his research showed that work involvement and positive working conditions can reduce nurse injury, indirectly reducing the risk of disease transmission to nurses.

The results of this study contradict the opinion of Silberstang and Hazy<sup>[35]</sup>, suggesting that microenactment allows organized learning at the group level even at the organizational level.

For this reason, enactment needs to be established to produce effective leadership in the public organization sector. The statement shows that individual enactment actually makes the organization effective.

Feyer and Williamson<sup>[36]</sup> suggested that nurses' compliance in implementing the standard precautions include individual (nurses) and organizational factors both, thus it can be said that organizational factors influence the application of standard precautions in an effort to reduce the risk of disease transmission and suggest that safety can be integrated into organizational management system. Furthermore, the research conducted by Purnomo<sup>[37]</sup> also argues that there is a relationship between workplace safety climate, leadership support, management commitment, and providing information together on the compliance with the application of standard precautions with an OR (odd ratio) of 0.436, meaning that 43.6% of compliance with the application of standard precautions is explained by the climate of occupational health, leadership support, management commitment, provision of information, while the remaining 56.4% is explained by other variables.

The implications of this study are that organizational factors can directly have an impact on the actions of nurses in reducing the risk of transmission and can also be through commitment so that nurses who are committed will take action to reduce the risk of transmission of the disease properly.

## CONCLUSIONS

Considering the results of this study, the following conclusion can be made:

1. Organizational factors related to the reduction of the risk of disease transmission have a major influence on the nurses' commitment to reduce risk so as to facilitate the adoption of behaviors to reduce the risk of disease transmission in hospitals
2. Organizational factors related to reducing the risk of disease transmission affect self-justification and labeling nurses as individuals who are at a risk of contracting a disease so as to facilitate the adoption of behaviors to reduce the risk of disease transmission in hospitals
3. Organizational factors related to the reduction of the risk of transmission of a disease do not affect the labeling of nurses
4. Organizational factors related to reducing the risk of disease transmission affect the commitment of nurses. A good perception of nurses of the organizational factors related to reducing the risk of disease transmission strengthens their commitment to reduce the risk of transmission
5. Organizational factors related to the reduction of the risk of disease transmission affect the nurses' enactment
6. Organizational factors related to the reduction of the risk of disease transmission affect self-justification where nurses label themselves as individuals who are at a risk of contracting a disease and then commit to reducing the risk of disease transmission so as to facilitate the adoption of behaviors to reduce the risk of disease transmission in hospitals.



## Recommendation

It can be recommended that hospitals should integrate the risk reduction of disease transmission into the organization's management system and apply it consistently in the management of the implementation of nursing services. The limitation of this study includes that it is focused solely on measuring organizational factors that play a role in reducing the risk of disease transmission. It is suggested that in the future studies, an assessment of organizational factors related to reducing the risk of disease transmission objectively and the addition of assessment indicators such as organizational culture should be incorporated to represent all aspects of an organization.

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There are no conflicts of interest.

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