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## Second victim support program and patient safety culture: A quasi experimental study in Bali International Medical Centre (BIMC) Hospital

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### ABSTRACT

**Background:** Patients are the first victims of patient safety incidents. However, healthcare providers are also the victims. In 2000, a doctor named Wu introduced the term “second victim” to describe the healthcare providers who involved in patient safety incidents. In Indonesia, there is no second victim support program implemented in the hospitals. Studies need to be done regarding second victim support program and its effect on patient safety culture.

**Objective:** To study the effect of second victim support program on patient safety culture.

**Method:** This study is a quasi-experimental study conducted from 2015 to 2017. The treatment given is the Second Victim Support Program. Eighty-seven healthcare providers in BIMC Hospital Kuta are selected as the treatment group, while another 103 healthcare

providers in BIMC Hospital Nusa Dua are selected as the control group. The study is analyzed with difference-in-differences and paired-sample t-test. Phase 1 (2015) is the baseline, phase 2 (2016) is when the program is implemented up to one year (to study its effect on patient safety culture), and phase 3 is one to two years after the treatment to study the sustainability of its effect.

**Result:** Difference-in-differences revealed that the treatment significantly increased the patient safety culture ( $\beta$  coefficient of 0.738, SE = 0.258, P-value = 0.007). There is no significant difference between patient safety culture in phase 2 and phase 3 ( $t(11) = 0.378$  with P-value of 0.713 and Cohen's d of 0.0476).

**Conclusion:** Second victim support program increases patient safety culture. If the program is maintained, the effect on the patient safety culture will be sustainable.

**Keywords:** second victim support program, patient safety culture, difference-in-differences

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### BACKGROUND

Patients are the first casualties of any patient safety incidents. However, caregivers are also one of the casualties. In 2000, Doctor Wu was the first person that mentions the term “second victim” for caregivers involved in patient safety incidents.<sup>1-4</sup> After being involved in adverse events, caregivers suffer physical, emotional, and professional distress. Even the most experienced and the resilient caregivers can be affected by sentinel events, which are very serious patient safety incidents.<sup>5-7</sup>

Dr. Wu described that the second victims follow a two-stage condition after being involved in patient safety incidents.<sup>1,3</sup> In stage one, the second victims experience shock, and they frequently pervaded by the incident. They suffer from sleep deprivation, irritability, and difficulty in concentrating; this stage is called guilt internalization. The second victims also suffer from shame and anger toward themselves, patients, and the hospital. Their mood and personality change in this stage, which lasts for several days or weeks. Some victims develop worsening of the condition, which advances into a post-traumatic syndrome that may last for years or even decades.

This stage is the second stage of the second victim phenomenon.<sup>1,8</sup>

Patient safety incidents can affect the personal and professional identity of the caregivers.<sup>1,4,8</sup> Hospital management needs to comprehend that second victim phenomenon can occur to any healthcare provider. Hospital management should attempt to retain the caregivers so that they can remain on duty as usual by providing resources and support for them. Resources and support include the provision of professional experts such as psychologist and psychiatrist.<sup>3</sup> Second victim support program consists of three components: (1) convince the caregivers that they do have valuable clinical skill and knowledge, (2) provide support and demonstrate respect, (3) confirm that they are the member of the valuable and reliable healthcare team.<sup>5,6,9</sup>

For nearly a decade, the second victims suffer alone without support from the management in dealing with distress that compromised their career.<sup>10</sup> This issue leads to the development and implementation of the second victim support program. Dr. Wu suggests policy development as

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the first step in the second victim support program implementation. The policy describes the official recognition from the management that there will always be the second victim and the hospital will support and respect the mission of second victim support program. Official posters and desktop reflecting such policy should be developed and socialized among all healthcare providers in all departments.<sup>1,11</sup> The standard operational procedure in supporting the second victims must be clearly defined so it can be used when the second victims require personal and professional support. The hospital will always be a vulnerable place for the caregivers working there, and they will always be at risk of making errors.<sup>3,8</sup> Many patients will suffer from patient safety incidents and the healthcare providers might suffer from physical, psychological, and professional distress.<sup>9,10</sup> Therefore, the development and implementation of the second victim program are the crucial steps in healing the healthcare providers.

In 1999, a report "To Err Is Human: Building a Safer Health System" was published and it encouraged the establishment of holistic strategy for the government, hospitals, healthcare providers, and patients to minimize the preventable adverse.<sup>12-14</sup> This report described that hospitals actually have the knowledge to prevent many medical errors. It was reported that preventable adverse events kill up to 100,000 people annually in the US. As a comparison, for each person killed in the US by a drunken driver, two people killed by preventable adverse events.<sup>15</sup>

Medical error, according to the Institute of Medicine (IOM), is a plan of care, either diagnostic or therapeutic, which is not performed accordingly, or a plan of care that is not consistent with the working diagnosis. The most common problems identified in healthcare service are adverse drug event, transfusion reaction, wrong site surgery, suicide, injury due to restraint, fall, burn, pressure ulcer, and incorrect patient identification.<sup>16,17</sup> The error occurred might cause disabilities which impact the productivity and income of the patient. Patient and family might lose trust in healthcare system associated with prolonged admission and physical as well as psychological distress due to medical error.<sup>18</sup>

Healthcare providers are also affected by the adverse events. Adverse events can trigger a various kind of feelings. Healthcare providers might be underperformed, frustrated since they cannot provide the best healthcare service for the patients, lose self-confidence, and lose professional identity.<sup>9,19</sup> In some cases, healthcare providers suffer from post-traumatic stress syndrome after involved in adverse medical events. The general symptoms of

psychological distress on the healthcare providers involved in adverse medical event include grieve, extreme sadness, guilt, disturbed remembrance, isolation, fear, regret, difficulty in concentrating, lost of self-confidence, self-doubt, frustration, anger, irritability, depression, anxiety, and questioning their career.<sup>20,21</sup> Healthcare providers also suffer from physical symptoms after involving in medical errors. Commonly occurring physical symptoms include eating disorder, sleeping disorder, headache, fatigue, diarrhea, nausea or vomiting, palpitations, and muscle spasms.<sup>4</sup> Unfortunately, the risk of committing another error is increasing if the healthcare providers suffer from second victim symptoms.<sup>5</sup> Healthcare service will never be perfect since it involves human being and to err is human. Any process involving human being is susceptible to commit errors. Nurses are healthcare providers that are vulnerable to suffer from stress and other second victim symptoms after being involved in a patient safety incident, and only a few of them receive support from the hospital when they commit the error.<sup>22</sup> Physicians are even at greater risk since they are fully responsible for the diagnoses established and the treatment planned. Some physicians consider having second victim signs, and symptoms of weakness hence make the problem worse.<sup>2</sup>

Even though there are many publications that increase our understanding regarding second victim phenomenon, there are many questions remain unanswered. In the studies that explain conditions which likely end healthcare providers' career, most of the literature focuses on the explanation of second victim experience. The issue that needs further investigation is the effect of second victim support program to the patient safety culture in the hospital. More information regarding this topic gives the opportunity to figure out the effect of second victim support program to the patient safety culture, which eventually will reduce patient safety incidences and promotes reporting of adverse events in the hospital. To date, there is no such study conducted in Indonesia.

## OBJECTIVES

1. Develop and implement second victim support program in BIMC Hospital in 2015
2. Evaluate its effect on patient safety culture in 2016
3. Evaluate the sustainability of its effect in 2017

## METHODS

This is a quasi-experimental study (controlled before-after study). The treatment is the

implementation of second victim support program which is adapted from 2010 forYOU toolkits (the revision of 2002 Medically-Induced Trauma Support System or MITSS). A total of 87 healthcare providers in BIMC Kuta were selected as the treatment group, while 103 healthcare providers in BIMC Nusa Dua were selected as the control group. Both hospitals have similar characteristics: (1) Both are located in tourism destination in Badung Regency (Kuta vs Nusa Dua); (2) Both passed hospital accreditation survey with *paripurna* (the highest level); (3) Bed occupancy rate is similar (78.6% vs. 77%); (4) Average length of stay is similar (2.6 vs. 2.8); (5) Out-patient department utilization is similar (38.3% vs. 38.8%); (6) Patient satisfaction index is similar (91% vs. 92.1%); and (7) Staff-to-bed ratio is similar (7.2 vs 7.4). Agency for Healthcare Research and Quality (AHRQ) Hospital Survey on Patient Safety Culture (HSOPSC) is used to evaluate patient safety culture in both hospitals. HSOPSC is distributed before the implementation of second victim support program and one year after the intervention to evaluate the effect of second victim support program on patient safety culture. For BIMC Nusa Dua, all healthcare providers are enrolled in the study, while for BIMC Kuta, only healthcare providers who have been working for at least four years are enrolled in the study. The reason is that healthcare providers working less than four years are more likely to move to other healthcare facilities, primarily government hospitals, so to ensure that the change in the survey is relevant to the program, this group of healthcare providers was excluded from the study.

To evaluate the sustainability of the program and its effect, the HSOPSC was redistributed two years after the implementation of the second victim support program (phase 3). Study regarding the sustainability of the program (phase 3) only involved BIMC Kuta since the program was only implemented in BIMC Kuta. BIMC Nusa Dua was not included in phase 3 of the study.

Data were analyzed by using difference-in-differences (DID). DID is a regression analysis with dummy variables utilized in econometrics and quantitative studies in social sciences that try to imitate experimental research design by using observational research data, by investigating the differential effect of treatment or intervention on the treatment group and the control group in the natural experiment.<sup>23</sup> Data were also analyzed with paired-sample t-test before (phase 1), and after (phase 2) the intervention is implemented. Paired sample t-test was also conducted on data collected one year (phase 2) and two years (phase 3) after the intervention to study the sustainability of its effect.

Paired sample t-test on phase 2 and phase 3 was only conducted on BIMC Kuta since the program was implemented only in BIMC Kuta. BIMC Nusa Dua was not included in phase 3 since they did not receive the program. Result

In BIMC Kuta, on the first phase, the HSOPSC was distributed in March 2015. Respondents were given two weeks to fill in the questionnaire and dropped it into the box provided on each floor (first until the fourth floor). From 87 questionnaires distributed to doctors and nurses, 47 (54%) questionnaires were filled in and put into the box. The result of this survey was used as the baseline prior to the implementation of second victim support program. Second victim support program was initiated in May 2015. It is adapted from 2010 forYOU toolkit which is the revision of 2002 MITSS (Medically-Induced Trauma Support System) toolkit. Socialization about second victim phenomenon was announced in the head of department meeting. The same socialization was also delivered in doctor meeting and nurse meeting and also included in General Orientation Program for new employees in Patient Safety Chapter. Second victim support posters were made and published on each floor. Second victim support program and TRUST (the five rights of the second victim) posters were also set as the screensavers on all personal computers (Appendices 1 and 2).



## Appendix 1



## Appendix 2

**Table 1** HSOPSC in BIMC Kuta on the First (2015) and the Second (2016) Phases in BIMC Kuta

No	Composite	First Phase (2015)	Second Phase (2016)
1	Teamwork within unit	80%	83%
2	Supervisor/Manager expectations & Actions Promoting Patient Safety	75%	79%
3	Management support for patient safety	72%	73%
4	Organizational learning - continuous improvement	72%	77%
5	Overall perceptions of patient safety	66%	71%
6	Feedback & Communication about error	64%	70%
7	Frequency of events reported	63%	65%
8	Communication openness	62%	75%
9	Teamwork across units	58%	66%
10	Staffing	56%	66%
11	Handoffs & transitions	45%	60%
12	Nonpunitive response to error	44%	67%

The second phase was done in June 2016, one year after the implementation of the program. HSOPSC was distributed among the same 87 doctors and nurses. They were given two weeks to fill in the questionnaire and put them into the

box provided on each floor. From 87 questionnaires, 60 (69%) questionnaires were filled in and put into the box. The result of the survey conducted on the first phase and the second phase can be seen in Table 1.

Paired-sample t-test revealed  $t = 4.284$  with P-value of 0.001 and Cohen's  $d$  of 0.854. There is a significant increase in patient safety culture after the implementation of second victim support program (means 3,54 vs. 3,15) with an effect size of 85,4% (large effect size). DID regression analysis was conducted to minimize confounding variables or omitted variable bias by studying the differential effects of treatment on the treatment group (BIMC Kuta) versus the control group (BIMC Nusa Dua) on the first and second phase of the study. The result of DID can be seen in Table 2. The DID reveal that the treatment implemented on the treatment group significantly increase the patient safety culture (DID coefficient of 0.738, SE = 0.258, p-value = 0.007).

On the third phase (one year after the second phase), HSOPSC were distributed among the same 87 doctors and nurses in June 2017. This phase was conducted in BIMC Kuta only because BIMC Nusa Dua did not receive the program. From 87 questionnaires distributed, 65 (75%) were filled in. The result of the second and third phases can be seen in Table 3. Paired-sample t-test revealed no significant difference between HOSPC on the second phase vs the third phase ( $t = 0.378$ ,  $P = 0.713$ , Cohen's  $d = 0.0476$ ).

## DISCUSSION

Patient safety movement is initiated by The Institute of Medicine through its report in 2000 "To Err Is Human: Building a Safer Health System". Since then various initiatives have been done to improve patient safety during healthcare service in the hospitals.<sup>21</sup> All of those efforts brought about positive impact on healthcare service. The current consensus in nearly all countries are focusing on international patient safety goals. The preventions of patient safety incidents are done through correct patient identification, effective communication, the safety of high-alert medications, correct-site, correct-procedure, correct-patient surgery, reduction of healthcare-associated infection risk, and reduction of patient harms resulted from falls.<sup>24</sup> Unfortunately, all patient safety initiatives focused only on one aspect, the patients, which in this case are the first victims. In 2000, Albert Wu, M.D., M.P.H. described the second victim phenomenon, which includes healthcare providers, primarily nurses, who were involved in sentinel

**Table 2** Difference-in-Differences Regression Analysis on HSOPSC of BIMC Kuta (treatment group) vs. BIMC Nusa Dua (control group) on the First and the Second Phases of the Study

	Coefficient	Standard Error	t	P-value
Constant	3.502	0.129	27.096	0.000
D <sup>Post</sup>	-0.348	0.183	-1.901	0.064
D <sup>Tr</sup>	-0.348	0.183	-1.901	0.064
D <sup>Post</sup> *D <sup>Tr</sup>	0.738	0.258	2.853	0.007

Note:

- D<sup>Post</sup>: dummy variable for treatment group and control group where 1 is treatment group and 0 = otherwise
- D<sup>Tr</sup>: dummy variable for time where 1 = post-treatment and 0 = otherwise
- D<sup>Post</sup>\*D<sup>Tr</sup>: multiplication of D<sup>Post</sup> and D<sup>Tr</sup>. Its coefficient is the difference-in-difference estimate.

**Table 3** HSOPSC on the Second (2016) and the Third (2017) Phases in BIMC Kuta

No	Composite	Second Phase (2016)	Third Phase (2017)
1	Teamwork within unit	83%	80%
2	Supervisor/Manager expectations & Actions Promoting Patient Safety	79%	77%
3	Management support for patient safety	73%	72%
4	Organizational learning - continuous improvement	77%	75%
5	Overall perceptions of patient safety	71%	72%
6	Feedback & Communication about error	70%	72%
7	Frequency of events reported	65%	71%
8	Communication openness	75%	73%
9	Teamwork across units	66%	67%
10	Staffing	66%	68%
11	Handoffs & transitions	60%	63%
12	Nonpunitive response to error	67%	63%

events.<sup>13</sup> However, only in 2007, a study regarding the second victim was conducted in University of Missouri Health Science. The study revealed that nearly one out of seven healthcare providers (175/1,160) were involved in patient safety incident every year, which caused anxiety, depression, and lack of self-confidence. What worries us more is that 68% stated that they did not get support from the hospital.<sup>10</sup>

The study about second victim program was continued with a qualitative study to gain a deeper understanding of second victim phenomenon. In-depth interview was conducted on 31 healthcare providers consisted of 10 doctors, 11 nurses, and 10 other healthcare providers. From this study, 6 phases of second victim recovery is developed which includes: (1) Response against chaos and accident – error awareness; (2) Intrusive reflexion – event reevaluation and self isolation;

(3) Personal integrity restoration – dealing with gossips, questioning trust; (4) Endurance in inquisition – realize the urgency, anxious about continuity; (5) Looking for emotional comfort – where to seek help; and (6) Move on – drop out, coping, developed (gain insight, learn from incident).<sup>9</sup> Patient safety culture is the life-breath of the patient safety program. If the patient safety culture is employed appropriately, every health-care provider will have the courage to report every patient safety incident. There is a positive correlation between patient safety culture and the number of patient safety incident reported. The higher patient safety culture, the higher the number of the incidents reported. The higher report does not mean that the patient safety incident increases; instead, this signifies increases in the awareness and the courage to report patient safety incidents. Hospital with high patient safety culture, such as John Hopkins Hospital, has an in-patient department medication error proportion of 8%.<sup>25</sup> That is much higher than in-patient department medication error reported in BIMC Hospitals in 2016 which was only 2.1% on average. This does not mean that the medication error in John Hopkins Hospital is higher than in BIMC Hospitals. As a matter of fact, this means that staff in John Hopkins has higher awareness and courage to report all medication errors occur in their unit.

A study using AHRQ HSOPSC (which consists of 42 items categorized into 12 composites) and patient safety incidents (i.e., pressure ulcer incident, prolonged patient restraint, complaints, and medication error) revealed that the higher the score on composite “organizational learning – continuous improvement” the lower the pressure ulcer incident (OR = 0.249), prolonged patient restraint (OR = 0.406), and complaints (OR = 0.369); the higher the score on “frequency of events reported” the lower the incidence of medication error (OR = 0.699) and pressure ulcer (OR = 0.639). The other nine composites did not reveal any statistical differences.<sup>21</sup> This result suggested that the higher patient safety culture, the lower patient safety incident. Another study using AHRQ HSOPSC and AHRQ patient safety index was conducted on 179 hospitals. The result also suggested that the higher the patient safety culture, the lower the patient safety incident (beta coefficient varied from – 0.15 to – 0.41).<sup>14</sup>

Considering how important patient safety culture is, all interventions related to patient safety should adhere to patient safety culture. In the end, the effect on patient safety culture will affect the incident rate of adverse events and

the number of patient safety incident reported. Patient safety incidents increase, and at the same time, healthcare providers are encouraged to report the incidents without worrying of naming, blaming, shaming, and stigmatizing. Second victim support program is not a direct initiative to the healthcare service provided to the patient. However, it will increase the patient safety culture and hence decrease the rate of adverse events and increases the number of incidents reported. Second victim support program should be included in the patient safety program. This study showed that second victim support program would increase the patient safety culture (proven by the significant difference between the first and the second phases), and if the program is well-maintained, the effect will be sustainable (proven by no significant difference between the second and the third phases).

## CONCLUSION

Patient safety culture is the sustaining principle of every patient safety program in hospitals. All initiative related to patient safety should embrace patient safety culture, which eventually, impact the rate of adverse events and the number of incidents reported. Second victim support program positively affects patient safety culture. If such program is maintained, its effect on patient safety culture will be sustainable.

## LIMITATION

This study might have the probability of biases due to the possible difference in the composition of individuals in the treatment group (only 54-75% of the questionnaires were filled and returned).

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