Cakrawala Pendidikan
Jurnal Ilmiah Pendidikan
Vol. 41 No. 2, Juni 2022, pp.365-376
https://journal.uny.ac.id/index.php/cp/issue/view/2251
DOI: https://doi.org/10.21831/cp.v41i2.47490

Innovative education training program of hajj healthcare workers improves the outcomes of Indonesian elderly hajj pilgrims

Probosuseno[1]*, Fidiansjah[2], Wasilah Rochmah[1], Ali Ghufron Mukti[1]
[1]Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada,
[2]Director of Dr. Marzoeki Mahdi Psychiatric Hospital Bogor
*Corresponding Author: probosusenodr@gmail.com

ABSTRACT

The ability of the Muslim community in Indonesia to perform the hajj pilgrimage as the completion of the fifth pillar of Islam is increasing. With the increase in life expectancy, the number of Indonesian elderly hajj pilgrims (EHP) are consequently growing. This leads to an increase in morbidity and mortality in EHP due to chronic conditions such as impairments, disabilities, and diseases. Thus, an innovative training program that contains practical tips for a healthy hajj experience, especially for the elderly is needed in order to improve the healthcare service to the elderly pilgrims. This study aims to investigate the effect of innovative training on the performance of Hajj Healthcare Workers of Indonesia (HHWI) and on the clinical outcomes of elderly hajj pilgrims. This is a quasi-experimental study. The population of this study was all HHWI from the Surakarta embarkation in 2014. The sample of this study was all 21 HHWI from Yogyakarta, who received innovative training consisting of EHP special care training (theory and practice) in addition to basic national training. Twenty-one HHWI from Surakarta were randomly chosen as control group and only received basic national training. Pre and post-tests were used to assess knowledge of HHWI after training. The average pretest scores of the intervention and control groups were 48.50 and 48.07, respectively (p= 0.337), while the post-test score the of the intervention group was 86.83 (p = 0.033). The measured parameters were the performance of HHWI which is reflected by EHP mortality rate, the number of outpatients, and the number of patients referred to the outpatients. We included the EHP under the supervision of HHWI, which has acquired training. EHP morbidity was evaluated as number of outpatients and referred patient. There are 2216 outpatients from the intervention group as compared with 2144 in control group, with most of the are 60-70 years old (p= 0,075). The number of referred EHP in intervention and control groups were 10 and 30 patients, respectively (OR 2.94; p= 0.002). As for the mortality cases, we observed 7 EPH death during the hajj period (2 EPH from intervention group vs 5 EPH from control group; OR 0.263; p=0.207). Innovative training could reduce referral morbidity and mortality in elderly hajj pilgrims.

Keywords: innovative training-Hajj Healthcare Workers of Indonesia (HHWI/TKHI) -morbidity-mortality- elderly hajj pilgrims

Article history

Received:	*Revised:*	*Accepted:*	*Published:*
10 October 2021	*29 December 2021*	*20 March 2022*	*1 June 2022*

Citation (APA Style): Probosuseno, Fidiansjah, Rochmah, W., & Mukti, A. G. (2022). Innovative education training program of hajj healthcare workers improves the outcomes of Indonesian elderly hajj pilgrims. *Cakrawala Pendidikan: Jurnal Ilmiah Pendidikan*, *41*(2), 365-376. doi:https://doi.org/10.21831/cp.v41i2.47490

INTRODUCTION

In Islam, the hajj pilgrimage has special importance compared to other religious duties, as it can only take place at a certain time and in a certain place. In relation to the health and well-being of people with high-risk and chronic diseases, the pilgrimage can pose a bigger challenge due to the highly extensive activities, especially in a climate that is different from their home region (Sagala et al., 2009). The number of Indonesian hajj pilgrims is the largest in the world, with an average of 155,000 to 210,000 people every year during the hajj season (President of the Republic of Indonesia, 2008); Ministry of Health of the Republic of Indonesia, 2009).

The hajj health care in Indonesia is complex. According to the hajj management audit in 2012-2014, some of the Indonesian hajj did not comply the health standard to perform hajj (isthitaah) (Rustika et al., 2020). The Indonesian Ministry of Health has been announced strategies for hajj health management consisting of health coaching/guidance, health service, and health protection. This element is applied during the hajj preparation course, during the journey and the hajj process in order to maintain the health condition of the pilgrims (Singka & Ericca, 2020). Despite all of the above strategies, the risk of health issues especially in the elderly population remains high. Thus, special regulations, as well as strategies in this frail population, should be addressed.

The number of elderly hajj pilgrims (EHP) increases each year. The high number high-risk elderly pilgrims pose a high cost to the state as it also leads to high morbidity and mortality rates (Center for Data and Information of the Indonesian Ministry of Health, 2015). Based on the official report of HHWI on the embarkation, as well as the computerized system of the integrated hajj health sector, elderly pilgrims dominate the care wards at the Indonesian Hajj Medical Center and the Saudi Arabian hospitals (hereinafter abbreviated as SAHs) by 56% (Ministry of Religious Affairs, 2013). Extensive care which requires intensive facilities such as the intensive care unit (ICU) has raised concerns from the Saudi Arabian Ministry of Health regarding the elderly pilgrims' healthcare. Therefore, geriatric internists and geriatric consultants are involved in the health service for elderly pilgrims (Ministry of Religious Affairs, 2013; Singka & Ericca, 2020; Harimurti et al., 2021).

Three regional HHWI must guide on average 375 Hajj travelers, resulting in a ratio of HHWI to Hajj pilgrims of 1:125. As the number of medical personnel available to assist pilgrims are extremely low, it is very challenging to manage the pilgrims' condition. Moreover, not all HHWI have the same work experience, which has an impact on the pilgrims' health services. Almost all embarkations lacked health briefings and practical recommendations for dealing with elderly pilgrims, and some did not even provide any (Fahham et al., 2018; Ministry of Religious Affairs, 2013; Knecht-Sabres et al., 2018; Singka & Ericca, 2020).

This study has developed a new innovative training that contains practical tips for a healthy hajj experience, including a clapping exercise while singing a song that reminds the EHP to drink the Zamzam water and eat dates. The training is intended for HHWI so that they can provide the best health services for EHP. The innovative training can be delivered in a short period of time using simple and inexpensive media such as clapping games and sticker distribution. Singing and clapping hand are included in Korean geriatric program in order to prevent dementia (Yi et al., 2019). Clapping the hand stimulate sensory-motor, and support the physiological, emotional, social, and cognitive maturation among young age population (Brodsky & Sulkin, 2011a; Zhang et al., 2020). In addition, clapping hand improved physical wellness among the elderly in China (KK Tung & YC Leung, 2017). Thus, singing and clapping hand could be a simple and useful method for geriatric population which have broad range benefit from improving physical condition, preventing dementia, improving social life and emotion. Other than the hand-clapping games, the center for hajj health helps healthcare workers to recognize the symptoms and signs of dangerous diseases in hajj pilgrims. HHWI who have sufficient knowledge about geriatric problems and solutions, and have good performance in serving EHP, are expected to reduce morbidity and mortality.

The simple innovative training for HHWI is expected to improve the knowledge, attitude, and practice in health service, or in other words, improve healthcare workers' performance with a clinical outcome that reduces the morbidity and mortality rates.

METHOD

This type of research is a quasi-experimental study with a pre and post-intervention design using an external comparison group (Murti, 2003) in the field of geriatric internal medicine to determine the effect of innovative training for the hajj health workers of Indonesia (HHWI) during the hajj in 1435H/2014M on the morbidity and mortality of EHP. The research was conducted in Indonesia by providing innovative training for HHWI before leaving and by monitoring the implementation of health services provided by HHWI for EHP while in Saudi Arabia during the 2014 hajj season (starting from August 2014 to November 2014).

The research population was all HHWI (213 people) from the Surakarta embarkation in 2014, whereas the research sample was all HHWI (21 people) from the Yogyakarta Special Region, who served as the intervention group. The sampling was obtained through total sampling. The intervention group was given innovative training in the form of additional theoretical understanding and practice of special training to handle the elderly pilgrims in addition to the national general basic training. As a control, 21 people (taken at random) of the HHWI from the Surakarta embarkation only received basic general national training. In this study, the innovative training consists of the following: 1) The religious aspects of hajj including the values in helping others during hajj; 2) The aging process and problems, including treatments to the problems; 3) Tips for a healthy and *hajj mabrur* (accepted hajj) with a simple clapping and singing game method; The meaning and purpose of each line will be explained, and the participants will have the opportunity to practice. Furthermore, the tips will also cover how to detect symptoms of dangerous diseases in elderly pilgrims, as well as who must receive immediate care.

The materials also include an explanation about early late *tanazul*, *wuquf*, how to assist patients with hemodialysis, diabetes mellitus, dementia, benign prostatic hyperplasia, depression, as well as special tips for anticipating heat stroke, etc.; All interventional group healthcare staff included in this study received stickers, modules, notebooks, and stationery. The stickers should be delivered to all pilgrims in their group. All healthcare staff received a communication device to communicate and coordinate, as well as to report relevant events during hajj in Saudi Arabia.

Pre and post-tests were used to assess knowledge of HHWI after training. A pretest was carried out in both groups, and a post-test was done only on the intervention group. The measured parameters of the HHWI performance were reflected by the morbidity rates among the outpatients and referrals, as well as the EHP mortality rates under the management of two groups of HHWI throughout the hajj period. Morbidity rate refers to the number of elderly pilgrims who are sick and treated as outpatients who need to be referred to the hospital as recorded in the official healthcare service report. Mortality rate refers to the number of elderly pilgrims who died as demonstrated by a death certificate that was registered in the healthcare system and/or the official healthcare service report.

The indicator for the morbidity and mortality among EHP was based on the data from the computerized system of the integrated hajj health sector, the medical record and/or the data recap (secondary data) of the group and non-group services (Indonesian Hajj Organization Agency, etc.), including the 2014 HHWI official report. Meanwhile, the effectiveness of the training is assessed based on the change in the knowledge and understanding level of the healthcare workers regarding the healthcare of EHP.

Statistical Analysis

The morbidity and mortality rates were obtained from the health care system and/or healthcare service's data. The data were presented as mean ± SD for variables with a normal distribution and analyzed using the appropriate statistics (X2 test, Fisher exact test). The categorical variables were compared using the Chi-square test if the distribution was not normal. We used the SPSS 13.0 for Windows software to analyze the research variables. Results with $p<0.05$ were considered significant.

Ethical Clearance

This study was approved by the Biomedical Research Ethics Commission, Faculty of Medicine, Universitas Gadjah Mada, Ref: KE/FK/970/EC dated September 2, 2014. The study also obtained a permit from the Hajj Health Center of the Republic of Indonesia (dated September 11, 2014). All health workers studied received an informed consent form to participate in this study.

FINDING AND DISCUSSION

Finding

Subject characteristics

Subject characteristics (age, sex, experience, and profession) can be seen in Table 1. The mean age of health workers in the intervention group was younger than that in the control group (27 years old vs 39 years old, p= 0.079). Most of the healthcare staff are male with 53.37% in the intervention group and 46.63% in the control group (p= 0.979). Most of the healthcare staff are nurses in both groups (p = 0.938) with an average work experience of 107 months in the intervention group and 162 months in the control group (p = 0.042) (Table 1).

Tabel 1. Subject characteristics

Variable	Intervention group	Control group	p-value
Age (year)	27.74± 6.28	39.52±7.52	0.079*
Sex			
Male	15 (53.37)	13 (46.63)	0.797**
Female	12 (50)	12 (50)	
Status			
HHWI	21 (50)	21 (50)	0.569**
Local HHWI	6 (60)	4 (40)	
Profession			
Doctor	10 (52.63)	9 (47.37)	0.938**
Nurse	17 (52.94)	16 (47.06)	
Experience (month)	107.81±97.55	162±91.82	0.042**

Note: * Uji *Mann-Whitney* ** *Uji Chi-square*

Pre-test and post-test scores

Both the intervention and control groups were given a pretest with questions that had been assessed for reliability and validity. The pretest scores of the intervention and control groups were similar (48.5 vs 48.07, p=0.337). However, the intervention group's average post-test score was increased from 48,5 to 86,83 after the training (Table 2).

Table 2. Pretest and posttest score

Variable	Intervention group	Control group	p-value
Pretest	48,5	48,07	0.033*
Posttest	86,83	N/A	

Note: **Independent T-test*

Outpatient elderly hajj pilgrims

The number of outpatients aged <60 years in the intervention group was lower than those in the control group (3,039 vs 3,170, p = 0.124). Similarly in the 71-80 and ≥ 81 age groups, the intervention group had a lower number of outpatients. In contrast, in the 60-70 years age group, the number of outpatients in the intervention group was higher than that in the control group (1,672 vs 1,591, p = 0.075) (Table 3). Our study showed that most of the outpatients were diagnosed with respiratory tract infection, followed by hypertension, myalgia, gastrointestinal symptoms, and diabetes mellitus, similar to those in the control group (Table 4).

Referral elderly hajj pilgrims

The number of elderly pilgrims referred to the hospital were 10 patients in the intervention group, mostly aged 60-70 years, followed by the 71-80, and > 81 years age groups (Table 5). In contrast, the number of elderly pilgrims referred to the high care facilities in the control group was three times higher (p= 0.002; OR 2.9 (1.46-5.91)) (Table 6). The most common diagnosis in

the intervention group was cholelithiasis, while that in the control group was diabetes mellitus (Table 7). Interestingly, we found 2 patients with depressive episodes among elderly pilgrims who were referred to the high care facility.

Table 3. Number of EPH outpatient

Variable	Intervention group	Control group	p-value
Age (years)			
< 60	3039	3170	0.124*
60-70	1672	1591	0.075*
71-80	443	473	0.231*
≥ 81	101	80	0.124*
Total number	5.255	5.314	

Source: Siskohatkes Puskeshaji, 20145 * Independent T test

Table 4. Most common outpatient diagnosis in control vs intervention group

Rank	Intervention group	Control Group
1	Acute nasopharyngitis (common cold)	Acute nasopharyngitis (common cold)
2	Acute upper respiratory infectious of multiple and unspecified sites	Acute pharyngitis
3	Acute pharyngitis	Essential (primary) hypertension
4	Essential (primary) hypertension	Influenza due to identified influenza virus
5	Myalgia	Myalgia
6	Dyspepsia	Senility
7	Non-insulin-dependent Diabetes Mellitus	Acute bronchitis
8	Bronchitis, not specified as acute or chronic	Tension-type headache
9	Tension-type headache	Dyspepsia
10	Diarrhea and gastroenteritis of presumed infectious origin	Gastric ulcer

Source: Siskohatkes Puskeshaji, 2015

Table 5. Numbers of referral cases

	Age (years)	Intervention Group	Control group
Elderly	60-70	8	16
	71-80	1	10
	≥ 81	1	4
	Total	10	30
Non-elderly	<60	18	17
	Total	28	47

Source: Siskohatkes Puskeshaji RI, 2015

Table 6. Comparison of referred EHP in both groups

Group	Referred							
	No		Yes		Total		p-value	OR (CI 95%)
	N	%	N	%	N	%		
Intervention	719	98.49	10	1.51	730	100	0.002*	2.94 (1.46-5.91)
Control	667	95.70	30	4.30	697	100		
Total	1386	99.51	7	0.49	1427	100		

**Chi-square test*

Table 7. Most common diagnosis of referred patient in control and intervention group

Rank	Intervention group	Control group
1	Cholelithiasis	Non-Insulin-dependent Diabetes Mellitus
2	Asthma	Varicella (chickenpox)
3	Hypovolaemic shock	Unspecified Dementia
4	Hemorrhoids	Episode Depressif
5	Chronic Renal Failure	Bronchopneumonia, unspecified
6	Hypotension	Asthma
7	Dislocation, sprain, and strain of joints and ligaments at ankle and foot level	Cutaneous abscess, furuncle and carbuncle
8	Stroke, not specified as haemorrhage or infarction	
9	Gastric ulcer	
10	Insulin-dependent DM with peripheral circulatory complications (gangrene diabetic)	

Source: Siskohatkes Puskeshaji RI, 2015

Mortality in elderly hajj pilgrims

The mortality rate in the intervention group was lower than that in the control group (0.27% vs 0.72%). The elderly pilgrims in the intervention group had a 2.63 times chance of not dying compared to the control group (OR 2.63 (0.51-13.6), p= 0.207) (Table 8). Cardiovascular disease was the main cause of death among EHP, followed by respiratory infection, accident, hypovolemic shock, and hypoxia (Table 9).

Table 8 Mortality rate among EHP in both groups

Group	Mortality						p-value	OR (CI 95%)
	Survived		Died		Total			
	N	%	N	%	N	%		
Intervention	728	99.73	2	0.27	730	100	0.207*	2.63(0.51-13.6)
Control	692	99.28	5	0.72	697	100		
Total	1420	99.51	7	0.49	1427	100		

*Fisher Exact Test

Table 9. Cause of death among EHP in both groups

No	Cause of death	Intervention group	Control group
1	Cardiovascular	3	2
2	Respiratory infection, sepsis	1	1
3	Accident, Crushing injury	1	0
4	Hypovolemic shock	0	1
5	Hypoxia	0	1

Discussion

Basic geriatric knowledge for elderly care is important to all healthcare providers (Ridge, 2007). As the aging process is complex, comprehensive care is needed. A comprehensive geriatric assessment (CGA) was developed in order to accommodate the frail older patients' needs and avoid polypharmacy (Dagli & Sharma, 2014; Welsh et al., 2014). Thus, it is important to educate and train health providers so that they can work effectively with patients from older age groups. Lisa et al. reported that working experience with older people was valuable to get a better understanding of their problems(Knecht-Sabres et al., 2018). Furthermore, the emotional state of

the health provider concerning elderly patients also contributes to the outcomes of care (Crespo et al., 2019).

The goal of training and educating healthcare personnel is to provide awareness and approach to the prevention (and management) of certain healthcare issues, with shared knowledge, abilities, and attitudes. Training should address at-risk populations, such as the frail elderly population (Windhaber et al., 2018). We employed a pretest and a posttest to assess the participants' comprehension in this study. Our findings revealed that the training enhances the participants' knowledge and attitudes up to 44%. We assumed that our training method, which included clapping and singing, as well as simple properties such as stickers, might have influenced the posttest result. Ungu, 2014 reported an increased mark of 45.78% at the final evaluation on the English test after the clapping method (introduced as *Tepuk Keledai Cerdik*) was introduced to the students (Ungu, 2020).

The clapping game involves many organ systems of the body, including the musculoskeletal, neurological, and psychological systems (Brodsky & Sulkin, 2011). Messages are made simple and short due to the decreased ability of the elderly pilgrims to memorize. The health messages are quite comprehensive. The clapping movement involves the skeletal muscles (type 1), has a rhythm, and is done while yelling the words of healthy hajj tips to ensure that the pilgrims memorize them. The clapping game is better done repeatedly, as the learning ability and memory capacity may decline due to aging (Imhof et al., 2006). Regular exercise will maintain muscle strength, while the lack of exercise may result in disuse atrophy. When done together, the clapping and singing exercise may benefit the musculoskeletal system, the complexity of the nerve system and the neurotransmitters, as well as the psychological well-being as it is enjoyable to do (Gross et al., 2012).

Ungu (2014) developed the clapping method by referring to a study by Brodsky and Sulkin which identified the benefits of clapping. According to the findings, (1) clapping is beneficial to develop and improve the emotional, physiological, sociological, and cognitive needs among children and teenagers for further growth and development. Next, (2) the type of clapping that is good for health is when the entire surface of the palm meets the other in a rhythmic pattern and in a duration that is long enough to heat the palm surface increasingly and improve body performance, including stimulating the nerves to increase concentration. Moreover, (3) clapping also affects the neurotransmitters to stimulate the brain and affect the development of other parts of the brain. Lastly, (4) clapping also trains social integration and emotional behaviors. The happy atmosphere, the togetherness, and the nice-sounding rhythm manage to raise awareness on the importance of responsibilities, maintaining a friendship, and helping to get immersed and experience the beauty (Brodsky & Sulkin, 2011). Among the geriatric population, clapping hands could also improve physical wellness and prevent dementia (KK Tung & YC Leung, 2017; Yi et al., 2019).

In this study, we observed the number and conditions of both outpatients and referral patients, as well as the mortality rate among EHP to assess the outcomes of our training. The numbers of outpatients in both intervention and control groups were not significantly different. This might be due to the older population in the intervention group. The very old population have a higher risk for hospital visit due to their multimorbidity (Legramante et al., 2016). The majority of outpatients, up to 20%, suffer from upper respiratory disease. This finding is similar to a descriptive study on 3,876 hajj patients who were treated for upper respiratory diseases during Hajj season 1423 H at the outpatient department of a specialist hospital in Holly Makkah (Shakir et al., 2006). In our innovative training, we included a suggestion for wearing a mask. It is recommended that the mask protect the nose and the mouth, be self-made from soft materials, and be sprayed with a little water to keep the respiratory tract from drying out too quickly (Alfelali et al., 2020; Barasheed et al., 2016). The changes in the respiratory tract in the elderly include a decrease in the number and function of mucociliary, cough reflexes, and an increased risk of pneumonia. The declining immune senescence among the elderly population affects their immune response to infections; hence making them more prone to infections (Sharma & Goodwin, 2006). Upper respiratory tract diseases such as influenza could develop into pneumonia among the

elderly (Alfarisi & Asmedi, 2012). Thus, pneumonia vaccination is recommended for EHP prior to departure as it reduces mortality rate caused by pneumonia (Alqahtani et al., 2016).

All pilgrims are also encouraged to preserve their stamina by getting enough rest and eating nutritional foods. In our innovative training, we suggest that elderly pilgrims have adequate rest, drink enough water every 30-60 minutes with 5-10 sips on average, and eating nutritious food while avoiding food that may irritate the respiratory tract. For geriatric patients who cannot have rice, we suggest eating 12 medium-size dates as they equal to 200 calories. Dates contain various essential amino acids that are good for health. We developed an easy way to memorize the message for the elderly through a song. The song contains the message of drinking the Zamzam water and eating dates to boost their energy. Anorexia may happen to elderly pilgrims that are exhausted or have respiratory tract infections or dehydration (Landi et al., 2016). The mineral contained in the Zamzam water, as well as some dates will provide them with sufficient energy for a significant period (Reuben & Raji, 2012). In addition, zikr (repeated chanting of prayers) and the sholat prayers are spiritual efforts that are a part of complementary and alternative medicine (CAM). The EHP is also given a message on the observance of rules during the pilgrimage rites, including the observance of the hours of the throwing of *jumrah*, staying fit before the *wuquf* (a contemplative vigil) in Arafat, keeping a clean and healthy habit, being aware of the traffic and road rules, prioritizing the pillars and mandatory hajj rites, while also not forcing themselves in completing the rites.

The number of referral patients in our study was significantly lower in intervention group compared to that in the control group. According to our findings, the innovative training was able to reduce the requirement for higher-level services by 2.94 times. The HHWI in intervention group are trained to quickly detect symptoms and signs of dangerous diseases among hajj pilgrims which can worsen or lead to death without urgent care (Maughan, 2012). This is especially crucial in the Armina (Arafah, Muzdalifah, and Mina) phase and afterward. It is essential that coordination be done with other officers such as the hajj pilgrimage counseling group, the head of the group, and the head of the team. Officers who notice one or more of these symptoms must immediately contact HHWI. A study conducted by Madani et al. reported that pneumonia and heart problems are the most common diagnosis; some of which requiring intensive care services (Madani et al., 2006). Chronic diseases and infections were commonly observed in the elderly. In 2013, diabetes melitus was the most common cause of referral to hospitals among Indonesian pilgrims. However, our study observed that the common cause of referral to the hospital is due to cholelithiasis. Interestingly, we observed two cases of depressive episodes that needed to be referred to the hospital. A study conducted by Farah et al. reported that anxieties among the elderly during the hajj usually occur during *mabit* in Mudzdalifah and throwing *jumrah* in Mina due to overwhelming crowds, extremely hot conditions, emotional state of irritability, and declining physical conditions (Thirafi & Hakim, 2018). Another study reported depressive disorder as the common psychiatric disorder among hajj pilgrims (Alzahrani et al., 2021).

The government, through the Ministry of Health of the Republic of Indonesia, has made careful efforts to prevent any increase in morbidity and mortality rates. Therefore, there is already a high level of awareness among the healthcare workers as well as the hajj pilgrims. In addition, hajj pilgrims with health issues, despite of age, have been put in a group that is monitored before they depart for hajj. This group is identified as the high-risk group and must wear a special bracelet for identification (Center for Data and Information of the Indonesian Ministry of Health, 2015). The HHWI are expected to give tighter monitoring on the high-risk group and to quickly refer them to the hospital when needed. The challenge that is often encountered during the referral process is the communication issues in Arabic or English. Therefore, it is imperative that seasonal workers be recruited to assist HHWI or health workers from the Indonesian Hajj Organization Agency in communicating the patients' health issues to the Saudi Arabian hospital health workers (Singka & Ericca, 2020).

Mortality

The diagnosis of the cause of death of a hajj pilgrim can be determined based on the certificate of death or verbal autopsy (Pane et al., 2013). Our study reported that the mortality rate

in control group was higher than that in the intervention group. It was reported the most common cause of death was cardiovascular disease, followed by respiratory infection and hypovolemic shock. The cardiovascular disease condition, in addition to triggering factors such as the climate, exhaustion, hard condition, and dehydration may lead to serious conditions and death. Therefore, a quick response and care or referral are essential. Ideally, EHP with cardiovascular conditions must be monitored since before the departure and guaranteed the best condition during the hajj pilgrimage. The comorbid condition must be handled at the same time, as well (al Shimemeri, 2012).

In this study, the two patients who died were very old (above 80 years). The old age imposes a frail condition and causing each stressful condition such as exhaustion, dehydration, heat, and anxiety to only result in worsened conditions. Dehydration increases the risk of death among the elderly by almost >50% (El-Sharkawy et al., 2015). In addition, infection was also among the common cause of death in the elderly due to immune senescence. Thus, adequate information, education, and training for both medical staff and the elderly pilgrims are needed.

Efforts to reduce the mortality rate among EHP can be done through an active health promotion across Indonesia or included in the primary programs of community health centers. These efforts can also be supported by further selection in the regency level, the port health office level, and embarkation. Moreover, the government's regulation requires that 1 doctor be available for every 100 hajj pilgrims. In addition, although the meningitis vaccine has been made as a mandatory requirement, the pilgrims are not required to get other affordable vaccines that are beneficial to decrease the morbidity and mortality rates (especially pneumonia-related diseases) such as influenza and pneumonia vaccines.

CONCLUSION

Our study shows that innovative training can reduce the morbidity of referral elderly pilgrims with an odds ratio of 2.94 (p= 0.002). However, it did not reduce the morbidity of outpatient elderly pilgrims. Furthermore, innovative training can reduce the mortality rate of elderly pilgrims, especially in the Armina (Arafah, Muzdalifah, and Mina) phase and afterward with an odds ratio of 0.263 (p = 0.207).

REFERENCES

Al Shimemeri, A. (2012). Cardiovascular disease in Hajj pilgrims. *Journal of the Saudi Heart Association*, *24*(2), 123–127. https://doi.org/10.1016/j.jsha.2012.02.004

Alfarisi, T., & Asmedi, A. (2012). *Pengaruh Vaksinasi Pneumonia Terhadap Kejadian Pneumonia Pada Jemaah Haji Indonesia di Arab Saudi*.

Alfelali, M., Haworth, E. A., Barasheed, O., Badahdah, A. M., Bokhary, H., Tashani, M., Azeem, M. I., Kok, J., Taylor, J., Barnes, E. H., el Bashir, H., Khandaker, G., Holmes, E. C., Dwyer, D. E., Heron, L. G., Wilson, G. J., Booy, R., Rashid, H., Almasri, N., … Alzhrani, W. (2020). Facemask against viral respiratory infections among Hajj pilgrims: A challenging cluster-randomized trial. *PLoS ONE*, *15*(10 October). https://doi.org/10.1371/journal.pone.0240287

Alqahtani, A. S., Wiley, K. E., Tashani, M., Willaby, H. W., Heywood, A. E., BinDhim, N. F., Booy, R., & Rashid, H. (2016). Exploring barriers to and facilitators of preventive measures against infectious diseases among Australian Hajj pilgrims: cross-sectional studies before and after Hajj. *International Journal of Infectious Diseases*, *47*, 53–59. https://doi.org/https://doi.org/10.1016/j.ijid.2016.02.005

Alzahrani, A. S., Alqahtani, A. M., Elmorsy, S. A., Alhazmi, M., Mahdi, H. A., Albarakati, B., Alkhiri, A., & Hakeem, A. (2021). Prevalence of psychiatric disorders in Hajj pilgrims using MINI as a diagnostic tool. https://doi.org/10.1007/s10389-019-01110-3/Published

Barasheed, O., Alfelali, M., Mushta, S., Bokhary, H., Alshehri, J., Attar, A. A., Booy, R., & Rashid, H. (2016). Uptake and effectiveness of facemask against respiratory infections at

mass gatherings: A systematic review. *International Journal of Infectious Diseases*, *47*, 105–111. https://doi.org/10.1016/j.ijid.2016.03.023

Brodsky, W., & Sulkin, I. (2011). Handclapping songs: A spontaneous platform for child development among 5-10-year-old children. *Early Child Development and Care*, *181*(8), 1111–1136. https://doi.org/10.1080/03004430.2010.517837

Crespo, M., Guillén, A. I., & Piccini, A. T. (2019). Work Experience and Emotional State in Caregivers of Elderly Relatives. *Spanish Journal of Psychology*. https://doi.org/10.1017/sjp.2019.34

Dagli, R. J., & Sharma, A. (2014). Polypharmacy: a global risk factor for elderly people. *Journal of International Oral Health : JIOH*, *6*(6), i–ii. https://pubmed.ncbi.nlm.nih.gov/25628499

El-Sharkawy, A. M., Watson, P., Neal, K. R., Ljungqvist, O., Maughan, R. J., Sahota, O., & Lobo, D. N. (2015). Hydration and outcome in older patients admitted to hospital (The HOOP prospective cohort study). *Age and Ageing*, *44*(6), 943–947. https://doi.org/10.1093/ageing/afv119

Fahham, A. M., Jenderal, S., Ri, D., & Ii, N. (2018). P*enyelenggaraan Ibadah Haji: Masalah dan Penanganannya* hajj: problems and its solutions.

Gross, A. L., Parisi, J. M., Spira, A. P., Kueider, A. M., Ko, J. Y., Saczynski, J. S., Samus, Q. M., & Rebok, G. W. (2012). *Memory training interventions for older adults: a meta-analysis. Aging & Mental Health*, *16*(6), 722–734. https://doi.org/10.1080/13607863.2012.667783

Harimurti, K., Saldi, S. R. F., Dewiasty, E., Alfarizi, T., Dharmayuli, M., Khoeri, M. M., Paramaiswari, W. T., Salsabila, K., Tafroji, W., Halim, C., Jiang, Q., Gamil, A., & Safari, D. (2021). Streptococcus pneumoniae carriage and antibiotic susceptibility among Indonesian pilgrims during the Hajj pilgrimage in 2015. *PLoS ONE*, *16*(1 January). https://doi.org/10.1371/journal.pone.0246122

Hoffmann, T. C., Glasziou, P. P., Boutron, I., Milne, R., Perera, R., Moher, D., Altman, D. G., Barbour, V., Macdonald, H., Johnston, M., Lamb, S. E., Dixon-Woods, M., McCulloch, P., Wyatt, J. C., Chan, A.-W., & Michie, S. (2014). Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. *BMJ : British Medical Journal*, 348, g1687. https://doi.org/10.1136/bmj.g1687

Imhof, L., Wallhagen, M. I., Mahrer-Imhof, R., & Monsch, A. U. (2006). Becoming forgetful: How elderly people deal with forgetfulness in everyday life. *American Journal of Alzheimer's Disease and Other Dementias*, *21*(5), 347–353. https://doi.org/10.1177/1533317506292499

Kementrian Agama. (2013). Laporan evaluasi penyelenggaraan ibadah haji tahun 1434h/2013m.

Kencono Ungu, N. (2020). Learning Tenses Using "Tepuk Keledai Cerdik" Technique for First Semester Students of English Education Program. In *Literature, Linguistics and English Teaching*, *2*(2).

Kirkpatrick, D. L., & Kirkpatrick, J. D. (2009). *Implementing the Four Levels: A Practical Guide for Effective Evaluation of Training Programs*.

Knecht-Sabres, L. J., Wallingford, M., Lee, M. M., Gunn, J. F., Anaya, E. M., Getch, S. E., Krumdick, N. D., & Workman, G. M. (2018). The Impact of an Interprofessional Geriatric Training Experience: Attitudes of Future Healthcare Providers. *Journal of Occupational Therapy Education*, *2*(3). https://doi.org/10.26681/jote.2018.020305

Legramante, J. M., Morciano, L., Lucaroni, F., Gilardi, F., Caredda, E., Pesaresi, A., Coscia, M., Orlando, S., Brandi, A., Giovagnoli, G., di Lecce, V. N., Visconti, G., & Palombi, L. (2016). Frequent use of emergency departments by the elderly population when continuing care is not well established. *PLoS ONE*, *11*(12). https://doi.org/10.1371/journal.pone.0165939

Madani, T. A., Ghabrah, T. M., Al-Hedaithy, M. A., Alhazmi, M. A., Alazraqi, T. A., Albarrak, A. M., & Ishaq, A. H. (2006). Causes of hospitalization of pilgrims in the Hajj season of the Islamic year 1423 (2003). *Annals of Saudi Medicine*, *26*(5), 346–351.

https://doi.org/10.5144/0256-4947.2006.346

Maughan, R. J. (2012). Hydration, morbidity, and mortality in vulnerable populations. *Nutrition Reviews*, *70*(suppl_2), S152–S155. https://doi.org/10.1111/j.1753-4887.2012.00531.x

Menteri Kesehatan Republik Indonesia. (2009). Keputusan menteri kesehatan republik indonesia nomor 442/menkes/sk/vi/2009 tentang pedoman penyelenggaraan kesehatan haji indonesia.

Pane, M., Imari, S., Alwi, Q., Nyoman Kandun, I., Cook, A. R., & Samaan, G. (2013). Causes of Mortality for Indonesian Hajj Pilgrims: Comparison between Routine Death Certificate and Verbal Autopsy Findings. *PLoS ONE*, *8*(8). https://doi.org/10.1371/journal.pone.0073243

Presiden Republik Indonesia. (2008). Undang-undang republik indonesia nomor 13 tahun 2008 tentang penyelenggaraan ibadah haji.

Presiden Republik Indonesia. (2012). Peraturan pemerintah republik indonesia no 79 tahun 2012 tentang pelaksanaan undang-undang nomor 13 tahun 2008 tentang penyelenggaraan ibadah haji.

Pusat Data dan Informasi Kementrian Kesehatan RI. (2015). Situasi kesehatan jamaah haji Indonesia.

Reuben, R. C., & Raji, F. (2012). *Nutritional, socioeconomic and health benefits of dates*. www.ijfans.com/currentissue.html

Ridge, S. B. (2007). *Medicare and Medicaid*. In R. P. Soriano, H. M. Fernandez, C. K. Cassel, & R. M. Leipzig (Eds.), Fundamentals of Geriatric Medicine: A Case-Based Approach (pp. 73–79). Springer New York. https://doi.org/10.1007/978-0-387-32326-8_5

Rustika, R., Oemiati, R., Asyary, A., & Rachmawati, T. (2020). An evaluation of health policy implementation for Hajj Pilgrims in Indonesia. In *Journal of Epidemiology and Global Health*, *10*(4), pp. 263–268). Atlantis Press International. https://doi.org/10.2991/jegh.k.200411.001

Sagala, Dilliana, R., & Probosuseno. (2009). Faktor Risiko kematian jamaah haji Indonesia yang menderita penyakit pembuluh darah dan jantung tahun 2006-2008.

Shakir, H. A. S., Gazzaz, Z. J., Dhaffar, K. O., & Shahbaz, J. (2006). Outpatient Services during (1423h) Hajj Season. *Sultan Qaboos University Medical Journal*, *6*(1), 47–50. https://pubmed.ncbi.nlm.nih.gov/21748127

Sharma, G., & Goodwin, J. (2006). Effect of aging on respiratory system physiology and immunology. *Clinical Interventions in Aging*, *1*(3), 253–260. https://doi.org/10.2147/ciia.2006.1.3.253

Singka, E. J., & Ericca, I. (2020). Hajj health management in Indonesia. In *Medical Journal of Indonesia* (Vol. 29, Issue 2, pp. 117–119). Faculty of Medicine, Universitas Indonesia. https://doi.org/10.13181/mji.com.204749

Thirafi, F. Z., & Hakim, S. N. (2018). Elderly Anxiety in the Process of Regular Hajj. *Proceedings of the 3rd ASEAN Conference on Psychology, Counselling, and Humanities* (ACPCH 2017), 227–229. https://doi.org/https://doi.org/10.2991/acpch-17.2018.45

Welsh, T. J., Gordon, A. L., & Gladman, J. R. (2014). Comprehensive geriatric assessment--a guide for the non-specialist. *International Journal of Clinical Practice*, *68*(3), 290–293. https://doi.org/10.1111/ijcp.12313

Windhaber, T., Koula, M. L., Ntzani, E., Velivasi, A., Rizos, E., Doumas, M. T., Pappas, E. E., Onder, G., Vetrano, D. L., Roudriguez Laso, A., Roudriguez Manjas, L., Illario, M., & Roller-Wirnsberger, R. E. (2018). Educational strategies to train health care professionals across the education continuum on the process of frailty prevention and frailty management: a systematic review. In Aging Clinical and Experimental Research *30*(2), pp. 1409–1415). *Springer International Publishing*. https://doi.org/10.1007/s40520-018-0918-9

Won, C. W., Yoo, H. J., Yu, S. H., Kim, C. O., Dumlao, L. C. I., Dewiasty, E., Rowland, J.,

Chang, H. H., Wang, J., Akishita, M., Tan, T.-L., Lum, C., & Prakash, O. (2013). Lists of geriatric syndromes in the Asian-Pacific geriatric societies. *European Geriatric Medicine*, *4*(5), 335–338. https://doi.org/https://doi.org/10.1016/j.eurger.2013.07.005