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Is tuberculosis in children a severe disease?

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Abstract

Tuberculosis is a global health issue. However, childhood TB is often given less attention and neglected, particularly in the endemic area, due to the negative result of sputum smear and no specific signs and symptoms among children. Children exposed to infectious disease have a high risk of infection and progressing to TB disease, which may develop into a severe form, such as TB meningitis or military TB, and cause death. Therefore, case finding or contact screening is needed to prevent undiagnosed and untreated childhood TB. Parents or family and health professional staff should support adherence to preventive therapy for infected children and anti-TB treatment for TB disease.

Keywords: children; serious disease; tuberculosis

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Tuberculosis (TB) is one of the most common health problems worldwide, including among children. TB is the second leading infectious killer after Coronavirus disease (COVID-19). Even though the World Health Organization (WHO) estimated that although TB cases have declined recently, the decline has been very slow. In 2021, the WHO estimated TB cases at 10.6 million (range, 9.9–11.0 million), 11% of them being children. This number of cases was increased by 4.5% from the previous year (World Health Organization, 2022). Furthermore, the social distancing policy during the COVID-19 pandemic led to prolonged household contact, which may facilitate the household transmission of TB and increase TB cases (Alene et al., 2020). According to several studies, household contact is the leading cause of TB in children (Flamen et al., 2014; Martinez et al., 2020; Narasimhan et al., 2013).

Regarding acknowledging and increasing public awareness about TB and its impacts, World TB Day is observed annually on 24 March. The theme of 2023 is “Yes! We Can End TB”, which aims to end TB by 2030 (Stop TB Partnership, 2023). However, the increased attention to TB among children is a challenge, particularly in TB-burdened countries. Due to childhood TB incidence being lower and less than in adult, the child population is often neglected. TB treatments and programmes for children are also often excluded because they rarely have positive sputum smears (Mellado Peña et al., 2018). Furthermore, children exposed or infected with TB usually do not have signs and symptoms of TB (World Health Organization, 2018). Therefore, many parents or families have been unaware of their child’s condition and assumed that TB is not a severe disease and does not need to be treated.

Children in close contact and exposure to infectious TB have a high risk of infection and progress to TB (Seddon & Shingadia, 2014; Thomas, 2017; World Health Organization, 2013). In addition, the duration and intensity of contact, the level of infection bacteria, and immunology influence the progress of mycobacterium tuberculosis in children (Seddon & Shingadia, 2014; World Health Organization, 2013). The risk of progression to TB disease also depends on the children’s age; infected infants (less than 12 months), children at 1-2 years, 3-5 years, and 5-10 years have about 50%, 20-30%, 5%, and 2% risk of progression to disease, respectively (Seddon &

Shingadia, 2014).

So, how serious is TB disease in children? TB in young children may develop into a severe form of TB, such as TB meningitis or military TB. Furthermore, it was also reported 14% of deaths in children less than 15 years and 80% of deaths among those under five years (Holmberg et al., 2019; World Health Organization, 2018). The critical issue is that 96% of TB deaths in children were found to be in those who were undiagnosed and untreated (Holmberg et al., 2019). Children exposed to TB may develop to be infected with TB in several weeks or within one year of becoming infected. Therefore, contact screening among children is essential (Seddon & Shingadia, 2014).

Contact screening for children is a systematic process that aims to identify contacts among children who have or are at greater risk of developing TB disease (World Health Organization, 2014). However, of children with a contact history, only 40% received TB preventive treatment for children under five years and 0.6% for children more than five years (World Health Organization, 2022). In TB-endemic countries, TB has been found primarily in poor and vulnerable populations. Poverty, limited access to health services, and lack of knowledge about TB were the main barriers to taking their child for contact screening. Therefore, it will impact case findings of TB and delay getting diagnosis and treatment (Marais & Graham, 2016; Mellado Peña et al., 2018; World Health Organization, 2018).

To prevent the progression of exposure to TB to TB disease, children less than five years exposed to TB should receive prophylaxis or preventive therapy. This will decrease the development of TB disease during childhood (Mandalakas et al., 2021; Reuter et al., 2020; World Health Organization, 2014). In South Africa, the effectiveness of preventive therapy in reducing the development of TB was 82% (Martinez et al., 2020). However, children with TB disease should receive anti-TB treatment. This treatment has purposes for curing, preventing death, relapse of TB, development of drug-resistance, and reducing TB transmission (Holmberg et al., 2019; World Health Organization, 2014). However, successful preventive therapy and anti-TB treatment are dependent on the child's adherence to their therapy or treatment. At the same time, the child's adherence needs support from their family, nurses or other health professionals (Rakhmawati et al., 2022).

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Analysis of hospital management information system satisfaction using the end-user computing satisfaction method: A cross-sectional study

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Abstract

Background: The completeness of patient information can help improve the patient service process. However, the application of the hospital management information systems (HMIS) is experiencing obstacles that affect user satisfaction. The end-user computing satisfaction (EUCS) method was developed for improvement of HMIS in accordance with the needs of user in the field of medical records.
Purpose: To analyze the correlation satisfaction of HMIS and EUCS in hospital setting.
Methods: Quantitative descriptive design with a cross-sectional approach was conducted among 105 healthcare providers at Graha Sehat Medika Hospital from June to July 2022. The EUCS questionnaires related to aspects of content, accuracy, format, timeliness, and ease of use were used to measure user satisfaction of HMIS. A Pearson Product Moment was used to analyze the correlation between HMIS and EUCS user satisfaction.
Results: There was significant correlation between satisfaction of HMIS and components of EUCS (p= 0.001), including content (r= 0.705), accuracy (r= 0.651), format (r=0.538), timeliness (r= 0.706), and ease of use (r= 0.875). Furthermore, there were differences between ease to use of EUCS method and attending a computer course (10.93±2.66; p= 0.022) and gender (10.74±2.58; p= 0.007) of healthcare providers.
Conclusion: The EUCS method is important for improving HMIS satisfaction. Therefore, training and socialization of EUCS should improve to maintain ease of use of computers to increase satisfaction of management systems in hospitals.

Keywords: hospital; information; management; satisfaction

Introduction

Hospitals are required to implement a hospital management information system (HMIS) and provide guidance and supervision to improve health services. All health services provide information to managers in the process of managing health services in the hospitals (Machmud, 2018). Hospitals that have implemented HMIS require hardware and software to run HMIS in supporting the HMIS operations (Dinata & Deharja, 2020). Implementation of HMIS can operate optimally if there is integration between subsystems.

Therefore, the system does not stand alone and data transactions become faster (Odelia, 2018).

HMIS is a communication information technology system that processes and integrates the entire flow of hospital service processes in the form of a network of coordination, reporting and administrative procedures to obtain precise and accurate information, and is part of the health information system (The Ministry of Health of The Republic of Indonesia, 2013). HMIS has several benefits, including improving service quality, making decisions, and becoming a consistent control function (Salim, 2018). The hospital management information system (SIMRS) used in a hospital must provide convenience in operations and must be able to overcome patient service constraints (Setyawan, 2016).

The HMIS data from the Ministry of Health at the end of November 2016 reported that 1257 of 2588 hospitals in Indonesia (48%) had HMIS. The data also show that 5% of hospitals already have HMIS but are not running, 16% of hospitals do not have HMIS, and 28% of hospitals do not report whether they have HMIS or not. Meanwhile, HMIS was found in type C hospitals (597 hospitals) followed by type B hospitals (267 hospitals). However, in terms of proportion, HMIS is more common in type A hospitals (79%) and type B hospitals (73%) (Herlyani et al., 2020). This data indicated that HMIS is important to support management of services in hospital.

The HMIS is implemented as a form of electronic data exchange between healthcare workers, so as to ensure the availability of complete and efficient patient information with an indicator in the success of system development being user satisfaction (Sabdana, 2019). System user satisfaction is seen through response and feedback raised by the user after using the information system (Machmud, 2018). Completeness of patient information can help the patient service process improve, but the implementation of HMIS has problems that affect user satisfaction (Molly & Itaar, 2021) in the aspect of facilities and infrastructure, especially in terms of computer network instability which is considered to be too long and needs to be replaced, and expected software applications. adjust to the needs of the user (Sari et al., 2021), such as a system error occurred during service and there are some menus that are still lacking (Alfiansyah et al., 2020).

Furthermore, it is necessary to conduct a study related to the analysis of the satisfaction level of HMIS users using the (EUCS) method. Previous research related to SIMRS user satisfaction was the application of user satisfaction of the Integrated Admissions Information System using the End User Computing Satisfaction (EUCS) method at Dr. Saiful Anwar Malang Hospital. In the study respondents expressed satisfaction with the content aspect, while expressing dissatisfaction with the aspects of accuracy, shape, timeliness, and ease of use (Putri et al., 2020). Previous study using Electronic Health Record (EHR) user satisfaction using the EUCS (End User Computing Satisfaction) method at the Central Medical Record Unit of RSUPN Dr. Cipto Mangunkusumo resulted in the significance of the variables of 69.2%, content, 73.28% accuracy, 71.6% format, 65.66 timeliness and 69.33% ease of use (Alfiansyah et al., 2020).

Graha Sehat Medika Hospital (RSGSM) Pasuruan City is one of the type D private hospitals that have implemented a hospital management information system (SIMRS) starting in 2018. SIMRS at RSGSM has been implemented in all service units. However, in its implementation, it is still not fully using SIMRS because the application of SIMRS inpatient services does not support all the needs in filling out medical records so that hospitals still use manual medical records to support services. With the HMIS analysis, the next development and improvement of hospital management information systems can be in accordance with user needs both in terms of content, accuracy of information, form or interface display, ease of use, and timeliness in providing information so as to improve the quality of services at hospital. Therefore, the purpose of this study was to analyze the level of user satisfaction of HMIS and the EUCS method in hospitals in East Java Province, Indonesia.

Materials and Methods

Design

This study used a quantitative descriptive study with a cross-sectional approach from June to July 2022. This study analyzed the correlation satisfaction of HMIS and components of EUCS (including: content, accuracy, format, timeliness, and ease of use).

Sample and setting

This study was conducted at Graha Sehat Medika Hospital, East Java of Indonesia. The sample in this study was 135 healthcare providers (including medical doctor, nurse, midwifery, nutritionist, etc.) obtained using purposive sampling. The inclusion criterion of the study was healthcare providers who have a username and password to be able to access HMIS in the hospital. Meanwhile, 30 people were excluded from the study because they did not have the authority to access SIMRS and did not have a username and password into the hospital's EUCS system. Finally, 105 healthcare providers were included in this study.

Variable

This study measured characteristics of participants, including age, gender, areas of living, educational background, the profession, and length of work. Then, it also collected data of status of user the HMIS, experiences using computer, attending computer course, and level using computers to support using the management system of information in the hospital.

User satisfaction was collected by the EUCS satisfaction method, which included five components

Table 1. Characteristic of participants (n= 105)

Variable		n	%
Age (year)	20-30	89	84.8
	31-40	14	13.3
	41-50	2	1.9
Areas of Living	Near hospital areas	60	57.1
	Out of hospital areas	45	42.9
Gender	Male	23	21.9
	Female	82	78.1
Level of Education	Senior high school	2	1.9
	Diploma (3 years)	46	43.8
	Diploma (4 years)	19	18.1
	Bachelor	36	34.3
	Master	2	1.9
Occupation	Medical doctor	5	4.8
	Radiologist	4	3.8
	Laboratories analysis	4	3.8
	Information technologist (IT)	2	1.9
	Administrative staff	16	15.2
	Sanitarian	4	3.8
	Dental	3	2.9
	Nurse	32	30.5
	Midwifery	10	9.5
	Pharmacist	2	1.9
	Nutrition	2	1.9
	Medical record	21	20
Length of works	Less than 1 years	31	29.5
	1 – 5 years	69	65.7
	6 – 10 years	4	3.8
	10 – 15 years	1	1
Status of users	Active user	70	66.7
	Passive user	35	33.3
Experiences using Computer	Less than 1 years	14	13.3
	1 – 3 years	49	46.7
	4 – 6 years	25	23.8
	More than 6 years	17	16.2
Attending course of Computer	Yes	15	14.3
	No	90	85.7
Level using computers	Beginner	4	3.8
	Basic	31	29.5
	Middle	61	58.1
	Advance	9	8.6

such as content, accuracy, format, timeliness, and ease of use. This variable is used to measure the satisfaction of HMIS in the hospital.

Instruments

Self-administered questionnaire was used in this study. This questionnaire measured characteristics of participants and EUCS user satisfaction (Lim et

Table 2. Differences EUC of Satisfaction by Gender, attending course of computer, and status of users (n= 105)

	Gender					Attending course of Computer					Status of users				
	Male	Female	p	95% CI		Yes	No	p	95% CI		Active	Passive	p	95% CI	
	Mean ± SD	Mean ± SD		Min	Max	Mean ± SD	Mean ± SD		Min	Max	Mean ± SD	Mean ± SD		Min	Max
Content	18.96±3.17	18.27±3.03	0.888	-0.74	2.12	19.27±3.65	18.28±2.95	0.213	0.70	2.68	18.40±3.17	18.46±2.86	0.929	-1.32	1.20
Accuracy	17.87±4.00	17.62±2.95	0.199	-1.25	1.75	18.27±3.43	17.58±3.16	0.747	-1.08	2.46	17.66±3.46	17.71±2.63	0.932	-1.37	1.26
Format	15.04±2.27	14.01±2.35	0.248	-0.60	2.12	15.27±1.58	14.07±2.43	0.017	-0.09	2.49	14.26±2.49	14.20±2.11	0.908	-0.92	1.03
Ease to use	10.74±2.58	10.65±1.77	0.007	0.83	1.26	10.93±2.66	10.62±1.83	0.022	0.78	1.40	10.54±2.18	10.91±1.42	0.362	-1.18	0.43
Timeliness	7.26±1.74	7.02±1.24	0.337	0.40	0.87	7.07±1.87	7.08± 1.26	0.118	-0.76	0.74	7.13±1.43	6.97±1.20	0.297	-1.07	0.33
EUC of Satisfaction	69.87±11.98	67.57±9.56	0.486	-2.44	7.04	70.80±11.46	67.62±9.88	0.694	-2.41	8.77	67.98±10.76	68.26±8.86	0.898	-4.45	3.90

Note: Significance in Bold. Significance is determined by T-Independent Test

al., 2008). Instrument of EUCS user satisfaction is a questionnaire that measured satisfaction of healthcare providers regarding HMIS in hospital management system of information. This questionnaire included 19 questions using a Likert scale (1= strongly disagree to 5= strongly agree). The 19 questions were divided to five components of EUCS satisfaction method, such as content (5 items), accuracy (5 items), format (4 items), timeliness (3 items), and ease of use (2 items).

We tested the EUCS user satisfaction of instruments to measure the validity and reliability of the instrument among 30 of respondents at Mitra Sehat Medika Hospital. The validity is 0.70 and the reliability is 0.80. Therefore, the EUCS of satisfaction questionnaire is valid and reliable to perform in this study.

Data collection

Data collection in this study was by using self-administered questionnaire. This research stage was carried out by distributing questionnaires according to the specified sample who met the inclusion criterion at Graha Sehat Medika Hospital. The questionnaire was circulated using Google Form (G-form). Participants were submitted directly to the G-form to access information of characteristics of participants and the EUCS satisfaction.

The questionnaire was distributed using the help of a WhatsApp group. Instructions for filling out the questionnaire and the G-Form link we redistributed to the head of the room and the medical unit (SMF) at the hospital. The head of the room or SMF was given an explanation first by the researcher, then a briefing on how to fill out the questionnaire. The head of the room or SMF distributed via WhatsApp group in their room. If participants experiences difficulties in completing the questionnaire, then participants had a follow-up explanation by the head of the room or SMF regarding obstacles in filling out the questionnaire. If there was a misperception between the participants and the head of the room or SMF, then the researcher made clarification related to filling out the questionnaire.

Data analysis

SPSS version 27.0 software was used to analyze the data with significance $p<0.05$. The descriptive data were presented in frequencies for categorical data (including age, area living, gender, level of education, occupation, length of work, status of users, experiences using computers, attending computer course , and level using computers), while mean and standard deviations were presented for numerical data (EUCS of satisfaction). Independent t-test was used to analyze the differences in satisfaction regarding EUCS of satisfaction based on gender, attending computer course, and status of users. Then, Pearson Product Moment test was used to analyze the correlation between components of EUCS satisfaction method for HMIS in the hospital.

Table 3. Correlation between components of End User Computing of Satisfaction (n= 105)

	Content (r)	Accuracy (r)	Format (r)	Ease to use (r)	Timeliness (r)	EUC (r)
Content	1	0.705**	0.651**	0.538**	0.706**	0.875**
Accuracy	0.705**	1	0.652**	0.599**	0.703**	0.890**
Format	0.651**	0.652**	1	0.627**	0.592**	0.836**
Ease to use	0.538**	0.599**	0.627**	1	0.606**	0.772**
Timeliness	0.706**	0.703**	0.592**	0.606**	1	0.824**
EUC	0.875**	0.890**	0.836**	0.772**	0.824**	1

Note: EUC= End User Computing. **p<0.001. Significance is determined by Pearson product moment

Ethical consideration

This study was approved by The Ethical Committee of Clearance from Faculty of Dentistry, Universitas Jember with No. 1567/UN25.8/KEPK/DL/2021. All participants were informed as to the aim and objective of the study. Then, all participants voluntarily sign informed consent and attended to this study. Informed consent was given as an introduction at the beginning of the Google Form, while strengthening of informed consent was carried out by the head of the room or SMF who convinced participants about the study to be carried out.

Results

This study measured 105 healthcare providers in Graha Sehat Medika Hospital. Table 1 shows that age of participants was 20-30 years (84.8%) and female (78.1%) graduated with Diploma of Health (43.8%). Majority of participants had worked between 1-5 years (65.7%) and the majority were active users (66.7%). Regarding their experiences using computers to support management system of information the findings reflected that the majority had been using computers for 1-3 years (46.7%) with middle level of operation of computers (58.1%), although most had not attended of computers course (85.7%).

Table 2 shows the differences EUCS of satisfaction by gender, attending course of computer, and status of users. The use of computers in SIMRS related to EUCS is highly dependent on the operation of computer systems. Therefore, it was analyzed regarding the differences in user satisfaction of this EUCS system based on gender, computer course history and user status in hospitals. There were differences between ease to use EUCS method and attending computer course (10.93±2.66; p= 0.022) and gender (10.74±2.58; p= 0.007) of healthcare providers.

Table 3 reflects the correlation between components of EUCS method and HMIS in the hospital. There was significant correlation between satisfaction of HMIS and components of EUCS (p= 0.001), including of content (r= 0.705), accuracy (r= 0.651), format (r=0.538), timeliness (r= 0.706), and ease of use (r= 0.875).

Discussion

This study identified that there was significant correlation between satisfaction of HMIS and components of EUCS. Furthermore, there were differences between ease to use EUCS method and attending computer course of healthcare providers. The results indicated that the EUCS method is important for improving HMIS satisfaction (Htay et al., 2013). The EUCS method is relevant to measure user satisfaction in hospitals regarding management and information of systems (Aggelidis & Chatzoglou, 2012). The HMIS improved using integrated EUCS for delivery of services in hospitals (Bakar et al., 2020). Content on SIMRS should add various menus that are required by the user. Accuracy in SIMRS should add data validation to the system so that a warning will appear if there are data that are not filled or there is data duplication.

End User Computing Satisfaction (EUCS) is a method to measure the level of satisfaction of users of an application system by comparing the expectations and reality of an information system. The definition of End User Computing Satisfaction of an information system is an overall evaluation of information system users based on their experience in using the system (Syahrullah et al., 2016). Research reveals several findings that the information generated by the medical record system is enough to help the work of medical record staff, which can reduce workload and is considered more effective; therefore, it is highly recommended to adopt Electronic Health records & Management information systems (Safdar et al., 2019). However, there are some disadvantages of the medical record system such as the absence of guidelines for using the system, the high occurrence of errors in the system and the recording of diagnoses is still done manually (Machmud, 2018).

The system information administrator has access to the entire hospital management information system, to maintain that the application always in a state of operational readiness. In addition, the system administrator is the center of all activities using the information system in the hospital (Rustiyanto, 2011). Analysis is the elaboration of a complete information system into various component parts with the intention of being able to identify or evaluate various kinds of problems that

will arise in the system, so that the problem can be corrected or developed (Septiani et al., 2020). It is necessary to develop and improve the system in order to produce an information system that is easy to use according to user needs so that user satisfaction is achieved optimally, by providing a help menu on the system, because the help menu can help users when experiencing problems when using it.

This study identified that there was significant correlation between satisfaction of HMIS and components of EUCS. This finding is relevant with previous study that EUCS is a method for measuring the level of satisfaction of users of an application system by comparing the expectations and reality of an information system (Aggelidis & Chatzoglou, 2012). The application of EUCS in Malaysia shows that all EUCS dimensions (content, accuracy, format, timeliness and user convenience) greatly affect end-user satisfaction (Salim, 2018). Then, the form of system interface and timeliness in producing information from the system needs to be good enough and maintained and developed again to be even better.

The application of EUCS in Indonesia on user satisfaction shows that the level is in the very satisfied category. Dimensions that have a relationship with user satisfaction are content, accuracy, format and ease of use. The timeliness dimension has no relationship with user satisfaction. Therefore, this study recommends that all the information in the system is always updated according to the conditions in the field and the help links are optimized. The format on SIMRS should be improved, especially for the format of patient legibility letter items on the patient visit form by adjusting to user needs.

This study found that ease to use of EUCS method is dependent on the history of attending a computer course of healthcare providers. The EUCS model using this model emphasizes end-user satisfaction with the technology aspect, by assessing the content, accuracy, format, time and ease of use of the system (Doll & Torkzadeh, 1988). This model has been tested by many other researchers to test its reliability and the results show no significant difference even though this instrument is translated into different languages (Torkzadeh & Doll, 1991). So that with SIMRS that are attractive, easy to understand, and a system that works on time in producing information, it will facilitate the work of users, besides that it can also affect the level of satisfaction and effectiveness of work from users and improve the quality of service in hospitals.

In previous research related to HMIS user satisfaction using the EUCS method at Dr. Hospital. Saiful Anwar Malang, respondents stated that they were satisfied with the content aspect, while they were dissatisfied with the aspects of accuracy, format, timeliness, and ease of use (Sugandi & Halim, 2020). Therefore, training using technology and system information integrated by computers is important for healthcare providers to improve their satisfaction in hospital. Ease of use on SIMRS should provide a help menu on the system, because the help menu can help users when experiencing problems when using it.

This study found that ease to use of EUCS method has differences with gender of healthcare providers. Previous study on the satisfaction of Electronic Health Record users using the EUCS method at the Central Medical Record Unit of Dr. RSUPN. Cipto Mangunkusumo resulted in the significance of the variables of components of EUCS satisfaction (Alfiansyah et al., 2020). Graha Sehat Medika Hospital (RSGSM) Pasuruan City is a type D private hospital that has implemented a hospital management information system (SIMRS) starting in 2018. SIMRS at RSGSM has been implemented in all service units including the front office, outpatient installations, emergency department, inpatient installation (ward, perinatology, delivery room, operating room), support unit (laboratory, radiology, pharmacy, nutrition, medical record), billing unit and cashier. However, in practice it still does not fully use SIMRS because the implementation of SIMRS in inpatient services does not support all the needs in filling out medical records so that hospitals still use manual medical records to support services. Timeliness in SIMR requires carrying out periodic evaluation and maintenance of the system to monitor the performance and use of the system and its effect on hospital activities.

Conclusion

The EUCS of user satisfaction is correlated with satisfaction of HMIS for each component, such as content, accuracy, format, timeliness, and ease of use. The ease to use the EUCS method depends on attending a computer course and gender of healthcare providers. The EUCS method is important for improving HMIS satisfaction. Therefore, training and socialization of EUCS should improve to maintain of ease of use of computers to increase of satisfaction of management systems in hospital. It is necessary to develop and improve the system in order to produce an accurate information system according to user needs so that satisfaction is achieved, by adding data validation to the system, so that a warning system will appear if there are data that are not filled or there is data duplication.

Declaration of Interest

This study is stated that there is no conflict of interest of this study.

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Data Availability

Research thesis of Post graduated Master of Public Health, Universitas Jember.

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The relationship between sequential organ failure assessment (SOFA) score and mortality in COVID-19 patients with ARDS

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Abstract

Background: The WHO declared a COVID-19 pandemic on January 30, 2020. Five percent of all patients with coronavirus disease-19 symptoms are emergency and critical cases of ARDS by 49% mortality. The SOFA score is an assessment in intensive care unit patients to determine the level of organ failure.
Purpose: The research aimed to determine the relationship between SOFA scores and mortality in coronavirus disease-19 patients with ARDS.
Methods: This type of research was quantitative with a retrospective cohort design. The population was coronavirus disease-19 patients with ARDS in the intensive care unit room at RSUD dr. Moewardi in January-September 2021 with 485 people. Eighty-three (83) respondents were selected through the purposive sampling technique. The research instrument used the SOFA scoring sheet.
Results: The study on the characteristics of respondents revealed that 57.8% were male, the average age of respondents was 57.31 years and 57.8% with comorbid diseases. The abnormal SOFA scores were 96.4%, 91.6% mortality. The Chi-Square test showed a p-value of 0.018.
Conclusion: There is a relationship between SOFA scores and mortality in coronavirus disease-19 patients with ARDS. SOFA score could be used as a predictor of mortality in coronavirus disease-19 patients with ARDS. SOFA score scores can describe the patient's prognosis, because SOFA scores have an assessment of all six organ functions such as respiration (PaO2 / FiO2), blood pressure, creatinine and diuresis, bilirubin, platelets, and GCS, so that it is effective in assessing organ failure.

Keywords: ARDS; COVID-19; mortality; SOFA

Introduction

The severe acute respiratory syndrome coronavirus-2 is the cause of the COVID-19 that can attack animals and humans. In many cases, the COVID-19 virus causes only mild infections, such as the flu. The COVID-19 virus can attack anyone with mild, moderate symptoms, while 5% of them fall in a critical condition, Acute Respiratory Distress Syndrome (ARDS)(Xie et al., 2020). ARDS is an emergency in the respiration system that can occur due to fluid buildup in the alveoli which can result in disruption of oxygen exchange (Rumende & Wijaya, 2019).

In a study conducted in Lombardy, Italy, it was reported that out of 1,591 COVID-19 patients, 920 (58%) were treated in the ICU room which was then sampled for the study. The results showed that 37 patients needed mechanical ventilation intervention and 32 patients died on day 28 (Xie et al., 2020). Based on data in January 2021 at Wisma Atlet Kemayoran Jakarta, it was found that of patients with ARDS, in the first seven days 12% experienced mild ARDS and 16% experienced moderate ARDS which

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then deteriorated to severe ARDS. ARDS cases were found in 60-70% in patients in the ICU and as many as 94% ended in death. ARDS is a respiratory emergency disease that can cause breathing failure, ARDS is a major factor causing morbidity and mortality in coronavirus disease-19 patients (Yudha et al., 2021).

COVID-19 is one of the leading causes of mortality in the world; a study in the USA shows that >122,300 or 95% of deaths occur due to COVID-19 over a period of one year (Rello et al., 2020). Death prediction in coronavirus disease-19 patients accompanied by ARDS is very important, both clinically and administratively. Predicting the patient's condition can help to monitor the patient's condition and also provide information related to the prognosis of a disease which can be used as an indicator to determine the right therapy in the patient (Yulianto & Indriasari, 2020).

Sequential Organ Failure Assessment (SOFA) is a scoring instrument to assess dysfunction of an organ consisting of six assessment indicators with a score of 0-4 according to the degree of failure. SOFA score assessment includes the respiration system (PaO2/FiO2), cardiovascular (blood pressure), kidney (creatinine and diuresis), hepar (bilirubin), hematology (platelet count), and neurology (GCS) (Liu et al., 2020). SOFA score is the most commonly used assessment in critical patients, with sepsis (COVID-19) who are mechanically ventilated, and accuracy of SOFA scoring has been recognized by a number of clinicians. Changes in SOFA scores can predict outcomes; patients with a score of ≥2 have a predicted mortality rate of ≥10%. Similar research in Indonesia on this subject is still limitedly reported, so researchers want to know the SOFA score and its correlation with mortality in COVID-19 patients who experience ARDS so as to provide an overview of the relationship between SOFA scores and mortality. In previous studies it has not been specific in patients who experience ARDS (Wulandari et al., 2018). Furthermore, there has not been any literature assessing the validity of the SOFA score from the onset of severe respiratory distress in patients with COVID-19 pneumonia. We presented our novel research on the SOFA score in patients with COVID-19; we used time zero of the onset of severe respiratory distress and looked at the worst SOFA score within 48 hours.

Data on COVID-19 cases at RSUD dr. Moewardi for the January-September 2021 period were 6,263 cases with the number of ARDS cases as many as 485. Meanwhile, the data obtained by researchers from the Medical Record of Public Hospital in Indonesia for the January-September 2021 period showed the mortality rate of patients in the ICU and isolation rooms is still high, with the average patient dying <48 hours after being diagnosed or starting to be treated in the ICU (Medical Record RSUD dr. Moewardi, January-September 2021).

Materials and Methods

Design

The study design was a retrospective cohort. The population was coronavirus disease-19 patients with ARDS in the ICU at RSUD dr.Moewardi in January-September 2021.

Participants and Setting

This research data come from secondary data in the patient's medical record. Coronavirus disease-19 patients with ARDS in the ICU room at RSUD dr. Moewardi during the January-September 2021 period, comprising 485 patients, are the population in this study. The sample in this study was 89 respondents, using purposive sampling technique. Inclusion criteria of the study were patients who were confirmed positive for coronavirus disease-19, coronavirus disease-19 patients with ARDS, and adult patients aged ≥20 years. All SOFA score parameters were filled. Exclusion criterion for the study is incomplete medical peer data.

Variable

The independent variable in this study is the SOFA score, while the dependent variable is mortality.

Instruments

The data collection tool used by researchers is the SOFA scoring sheet. Data collection was carried out in the medical record installation room at RSUD dr. Moewardi. When the collected data reaches the number of research samples, data analysis then carried out.

Data collection

Data were collected using SOFA scoring sheet by the first author in April 2022.

Data analysis

The data analysis used was a univariate analysis for the categories of sex, age, comorbid diseases, SOFA scores, and mortality. Bivariate analysis used the Chi-Square test to determine the relationship between SOFA scores and mortality in COVID-19 patients with ARDS at RSUD dr. Moewardi. All data were analyzed using SPSS version 26.0.

Ethical consideration

This research was ethically approved by the Research Ethics Committee of Kusuma Husada University, Surakarta with the number 348/UKH.L.02/EC/III/2022. All documents required for data collection have been approved through informed consent.

Results

The result of the study based on Table 1 show that most of the respondents are men (57.8%). According

Table 1. Demographic data for the respondents (n = 83)

Characteristics of respondents	n (%)
Sex	
Men	48 (57.8)
Women	35 (42.2)
Age (years), Mean ± SD	57.31 ± 13.940
Range : 25-89 years old	
Comorbidities	
Exist	48 (57.8)
None	35 (42.2)

Table 2. Frequency distribution of respondents' characteristics based on SOFA Score and mortality in COVID-19 patients with ARDS

Variable	n (%)
SOFA Score	
Normal (0-1)	3 (3.6)
Abnormal (2-4)	80 (96.4)
Mortality	
Dead	76 (91.6)
Life	7 (8.4)

Table 3. Relationship of SOFA Score with Mortality in Coronavirus Disease-19 Patients with ARDS

			Mortality		Total	p-value
			Dead	Life		
SOFA Score	0-1	Count	1	2	3	0.018
		% within Sofa	33.3%	66.7%	100.0%	
	2-24	Count	75	5	80	
		% within Sofa	93.8%	6.3%	100.0%	
Total		Count	76	7	83	
		% within Sofa	91.6%	8.4%	100.0%	

to Susilo et al. (2020), the most important factor for men being infected with COVID-19 with ARDS is because the prevalence of men who become active smokers is higher. The outcome of a research conducted by Liu et al. (2020) also claimed that males are more vulnerable and dominate in cases of coronavirus disease-19 with ARDS rather than females. Research conducted by Putri et al. (2021) also stated that males are 28% more at risk of being infected with coronavirus disease-19 with ARDS than females, this is due to different hormones and chromosomes between men and women which allows women to have a stronger immune system than men.

The results of the study based on the SOFA score of the respondents showed that the majority had an abnormal SOFA score (2-24) as much as 96.4%. Research conducted by Ma and An (2022) also explained that the majority of COVID-19 patients had high SOFA scores.

Based on Table 3, the results of the Chi-Square test, a Fisher exact test was obtained with a p value = 0.018 (p-value <0.05). The results showed that there was a significant relationship between the SOFA score and mortality in coronavirus disease-19 patients with ARDS at RSUD dr. Moewardi. This study is in line with research conducted by Ganesan et al. (2021) that there is a meaningful relationship between SOFA scores and death in coronavirus disease-19 patients. Khwannimit et al. (2018) also added that SOFA score has a high sensitivity in predicting mortality.

Discussion

Research conducted by Zeng et al. (2020) shows that females have a more preponderant antibody response than males, with the production of these antibodies at the beginning of the phase showing the possibility of immunological processes that can result in a faster recovery from COVID-19 in females

compared to males.

The average age of the respondents is 57.31 with a minimum or youngest age of 25 years and a maximum age of 89 years. Research conducted by Elviani et al. (2021) states that one of the risk factors for being infected with coronavirus disease-19 with ARDS is the age of >50 years. In a study conducted by Ramananda and Khomdram (2020), it was also explained that the elderly have a prevalence of being two times more vulnerable or at risk of getting infected with coronavirus disease-19. In the study conducted by Drew and Adisasmita (2021), elderly people were found to have a reduced hemeostic reserve function; this happens because, as they get older, it results in the elderly no longer being able to fight infections such as COVID-19.

For frequency distribution based on comorbid diseases, the results showed that the majority of respondents had comorbid diseases (57.8%). A study conducted by Guan et al. (2020) stated that comorbid diseases such as diabetes mellitus, cardiovascular and lungs will result in a bad prognosis in patients infected with coronavirus disease-19. This is in line with research in the field that the majority of coronavirus disease-19 patients have a story of comorbid diseases and have a poor prognosis and end up dying. Research conducted by the Centers for Disease Control and Prevention (CDC) found that 94% of deaths due to coronavirus disease-19 in the United States occur because the patient has a comorbid disease (Setyarini & Dwianggimawati, 2021).

According to research conducted by Ferreira (2015), patients whose SOFA scores were measured for 48 hours and experienced a significant increase had a mortality rate of >50%, while patients who experienced a decrease in SOFA scores had a mortality rate of 23%, and patients who did not experience a change in SOFA scores had a mortality rate of 31%.

Frequency distribution of respondents' characteristics based on mortality in COVID-19 patients with ARDS shows that the majority of respondents died (91.6%). The study conducted by s also explained that the complications of COVID-19 with ARDS are indeed very high and cause a poor prognosis and result in a high mortality rate. Based on research conducted by Nugrahani and Fauzi (2022), ARDS is the main factor that causes death in the majority of COVID-19 patients. A study conducted by Sirvent et al. (2022) also said that ARDS in coronavirus disease-19 patients can increase the risk of mortality by up to 28%. This study is also in line with research conducted by Gujski et al. (2022) which stated that COVID-19 patients with ARDS can experience 1.27 times faster death than COVID-19 patients without ARDS.

Data show that most of the coronavirus disease-19 patients with ARDS at RSUD dr. Moewardi have a SOFA abnormal score (2-24). This study is in line with research conducted by Zhou et al. (2020) which states that SOFA scores in COVID-19 patients do tend to be higher. In a study conducted by Sari (2019), SOFA score scores can describe the patient's prognosis, because they have an assessment of all six organ functions such as respiration (PaO2 / FiO2), cardiovascular (blood pressure), kidneys (creatinine and diuresis), hepar (bilirubin), hematology (platelets), and neurology (GCS) so that it is effective in assessing organ failure, which is the higher the value of the addition of SOFA, the higher the level of organ damage experienced by the patient. According to research conducted by Kashyap et al. (2021), SOFA scores have been shown to be effective in predicting mortality in patients treated in the intensive care unit room.

SOFA scores have six indicators, one of which is respiratory (PaO2 / FiO2) which is one of the indicators of patients in experiencing ARDS and these indicators can also determine the condition of sepsis in coronavirus disease-19 patients (Timuda et al., 2020). In a study conducted by Tushar et al. (2020), it was stated that respiratory factors are the strongest predictors of patient mortality in the ICU. The incidence of Acute Respiratory Distress Syndrome (ARDS) in coronavirus disease-19 patients mostly has poor output; , death in coronavirus disease-19 patients with ARDS treated in the ICU room ranges from 21-61.5% even up to 94% (Putra et al., 2021). ARDS is the majority of complications suffered by COVID-19 patients, of which ARDS is the main cause of mortality in coronavirus disease-19 cases (Tomazini et al., 2020). SOFA score in COVID-19 patients with severe respiratory distress strongly correlates with the initial SOFA score. It is a valuable tool for predicting mortality in COVID-19 patients (Fayed et al., 2022).

According to the World Health Organization (WHO), coronavirus disease-19 patients who are aggravated with ARDS and comorbid diseases as well as advanced age can be associated with higher mortality rates. This can be measured by SOFA scoring; a SOFA score ≥2 can be said to have entered sepsis (Ramananda & Khomdram, 2020). The limitation in this study is that the researchers did not identify in detail the types of comorbidities in COVID-19 patients.

Conclusion

There is a relationship between the sequential organ failure assessment (SOFA) score and mortality in coronavirus disease-19 patients with ARDS. SOFA scores have the potential to be used as a good instrument to predict mortality in COVID-19 patients with ARDS so that it can assist in determining further interventions in patients so as to increase the cure rate and reduce the mortality rate.

Declaration of interest

There is no conflict in this research.

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Data Availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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The effectiveness of wound caring technique with *polyhexamethylene biguanide* and *dialkyl carbamoyl* chloride to healing process duration of diabetic foot ulcer patient

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Abstract

Background: Antimicrobial dressing on moist-based wound care is a successful wound care technique, especially for diabetes mellitus wounds. The moisture on wound can be made by closed wound care to reach a standard moisture in various wounds. The antimicrobial dressing type that can increase the wound healing is *Polyhexamethylene biguanide (PHMB)* and *Dialkyl carbamoyl chloride (DACC).* Polyhexamethylene biguanide can accelerate the tissue granulation and reduce the risk of infection. Dialkyl carbamoyl chloride is a part of moist wound healing with strong hydrophobic threat so the bacteria will be lifted and accelerate the wound healing process.
Purpose: The aim of this research is to analyze the effect of healing technique using *Polyhexamethylene biguanide* and *Dialkyl carbamoyl chloride* wound healing process on diabetic foot ulcer patients.
Methods: This research was quasi-experimental with 129 respondents. The instruments were Bates Jensen's observation sheet and data were processed by double linear regression.
Results: It was obtained an average difference between the duration of the wound healing process between PHMB and DACC therapy with a p-value of 0.0005.
Conclusions: The use of this type of DACC dressing is more effective against the duration of the healing process of diabetic foot ulcers because of the time needed for DACC to work on killing bacteria in-vitro in 30 minutes compared to other dressing.

Keywords: diabetic foot ulcer; wound healing

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Introduction

The diabetic prevalence numbers in Indonesia has increased significantly for the last five years. In 2013, the diabetic prevalence numbers in adults reached 6,9% and in 2018 increased to 8,5% (Research and Development of Ministry of Health of the Republic of Indonesia, 2018). In 2019, 463 million from total population worldwide or about 9,3% of adults in 20-79 age years old had diabetes based on global diabetes mellitus prevalence. Indonesia was in 7th highest rank for adults with diabetes mellitus in the world with over 10.7 million people in total. This number us predicted to increase and reach 16.7 million in 2045 (International Diabetes Federation., 2019). The ulcers followed by infection, gangrene, amputation, and death were a serious complication and required a higher amount of cost and longer care. Long wound healing process is caused by inappropriate wound handling in diabetic ulcer (Ekaputra, 2013). Diabetic ulcer healing duration requires about 2-3 weeks for1st stadium, 3 weeks to 2 months for 2nd stadium, ≥ 2 months for 3rd stadium, and 3 to 7 months for 4th stadium (Arisanty, 2013). Amputation is a serious consequence from Diabetic Foot Ulcer (DFU) (Decroli, 2019). *Polyhexamethylene biguanide (PHMB)* is an antiseptic

with *polyhexamethylene biguanide* which is a fatty acid derived with strong hydrophobicity (Febriani, 2018). PHMD has a strong-based bactericidal bond to negative phosphate in bacteria phospholipid membrane, destroys outer membrane from bacteria cell wall through permeability disturbance and removes bacteria cytoplasm cell by osmosis (Kurnia, Sumangkut, & Hatibie, 2017). PHMB fluid requirement is more effective and efficient compared to irrigation (p=006; p = 0.02; CI 95%) (Kristianto, 2016). DACC will bind and deactivate bacteria / microorganism. This bound is irreversible so that the bacteria / microorganism will be ruptured while the dressing is changed. The ruptured bacteria will fasten the wound healing process (Febriani, 2018). There are several factors affecting foot ulcers infection, depending on the ulcer factors (location, space, chronic or not, previous amputation, ischemia degree) and patient factors (age, kidney disorder, diabetic period, related comorbidity) (Juni, 2019). Foot ulcers care is complex and requires a multidiscipline approach related to debridement treatment, exudates purulent disposal, adequate antibiotic therapy, revascularization and wound care management (Juni, 2019). In patients with diabetic foot ulcer, 80% in Indonesia are cared for at home. It was found about 15% patients with diabetic foot ulcers, 30% with amputation risk and 32% of mortality (Sulistyowati, 2015). This research was aimed to analyze PHMB and DACC to wound healing duration in diabetic foot ulcer patients.

Materials and Methods

Design

This research was conducted at Bekasi Hospital with a letter of ethical review approval from Universitas Medika Suherman. This research applied four main principles in the ethics of nursing research: right to self-determination, anonymity and confidentiality, right to fair treatment, justice, right to protection from discomfort and harm. The research used quasi-experimental design.

Participants and Setting

The population was 129 respondents. Inclusion criteria were retinopathy ulcer feet respondents, Wagner stadium 3, get regular maintenance, and in inflammatory elongated phase. Exclusion criteria were ulcer retinopathy three feet with Wagner, no infection and cooperative.

Data Collection

The data were collected by using Bates Jensen observation sheets. The wound care applied was Antimicrobial Dressing every 2-3 days assumed from Standard Operating Procedures (SOP). The observation held was based on 3rd Wagner wound condition on 1st, 14th, 16th, 18th and 21st day to wound care schedule. On the 21st day, if the wound repair showed granulation, the researcher continued the observation until the granulation was seen.

Data Analysis

This research used bivariate analysis for the group that received special treatment the treatment of injuries using PHMB and DACC to lengthen the healing process wound with independent t-test. If the result of the test obtained p value=.05, it implies using the t-test and multivariate applied double linear regression to control the confounding possibility.

Results

The bivariate analysis using independent t test for categoric data reported no significant association in terms of dressing type (p value=.432), age (p value=.158), nutrition status (p value=.397) and significant association in terms of mobility (p value=.002), comorbidity (p value=.023), and medicine consumption (p value=.010) to the duration of wound healing process.

Included variables in the hierarchical regression analysis were decided based on p value of 0.25. In the first model, there were significant data in bivariate analysis. Bivariate selection was held after each independent and confounding variable had a bivariate analysis with the dependent variable. If the bivariate result was p-value < 0.25 those variables went to the multivariate level.

In Table 1, it was concluded that there was a variable with p-value score > 0.25 included in modeling and four variables, age, comorbidity, mobility and medicine consumption, had p-value score < 0.25. But because of the kind of dressing for having an independent mind and dressings are still included in the candidates. The same thing with the status of nutrients, which have significant roles in the healing process wound so nutrients status is still included in modeling. These six variables became the candidates and were able to be included in multivariate modeling.

The second model included effectiveness of PHMB and DACC to the duration of the wound healing process by making a model including variable and potential confounders without including interaction (interaction test was not performed).The modeling as presented in Table 2 was gained.

Table 2 shows the result from bivariate selection is that there were two variables with p-value score >0.05, dressing type, age and nutrition status, so those will be removed from modeling. The variable removed was a variable with the highest p-value score, age.

In Table 3 model 1, age, nutrition status, and mobility affected significantly to the duration of the wound healing process (p-value score < 0.05), while the dressing type and medicine consumption variables had p-value score > 0.05 so the null hypothesis was accepted which means those variables did not affect significantly the duration of the wound healing process. After identifying two variables that did not affect significantly the duration of wound healing process, the regression test was repeated by excluding the variable with highest

Table 1. Bivariate Selection Result of Research Variable

Variable	p-value
Dressing Type	0.432
Age	0.158
Nutrition Status	0.397
Comorbidity	0.023
Mobility	0.002
Medicine Consumption	0.010

Source: Primary Data

Table 2. Initial Modeling The Effectiveness of PHMB and DACC to the Duration of Wound Healing Process at Bekasi Hospital

Variable	Initial Modeling			
	Coefficient B	SE	T	p-value
Dressing Type	-0.643	2.086	-0.308	0.758
Age	0.029	0.135	0.216	0.829
Comorbidity	-5.576	2.171	-2.569	0.011
Nutrition Status	2.037	1.871	1.089	0.278
Mobility	-4.238	2.097	-2.021	0.045
Medicine Consumption	7.503	2.507	2.993	0.003

R Square: .163

Table 3. Double Linear Regression Modeling

Variable	Model 1	Model 2	Model 3	Model 4
	p-value	p-value	p-value	p-value
Dressing Type	0.758	0.798	-	0.814
Age	0.829	-	0.009	0.716
Comorbidity	0.011	0.010	0.285	0.019
Nutrition Status	0.278	0.260	0.040	-
Mobility	0.045	0.046	0.001	0.033
Medicine Consumption	0.003	0.003	0.896	0.002

Note: *Confounding

Table 4. Final Model Result Effectiveness of Antimicrobial Dressing Apply to the Duration of Wound Healing in Health Services at Bekasi Hospital

Variable	Initial Modeling			
	Coefficient B	SE	T	p-value
Dressing Type	-0.643	2.086	-0.308	0.758
Age	0.029	0.135	0.216	0.829
Comorbidity	-5.576	2.171	-2.569	0.011
Nutrition Status	2.037	1.871	1.089	0.278
Mobility	-4.238	2.097	-2.021	0.045
Medicine Consumption	7.503	2.507	2.993	0.003

R Square: .163

p-value score, the medicine consumption.

Dressing type was removed from modeling because it has p-value > 0.05 so the linear regression test was repeated. After the linear regression test was performed by removing dressing type variable, the calculation result of each variable did not change more than 10%. From the analysis result, p-value > 0.05 no longer existed so the variable searching process included in modeling was completed. Next, the final modeling was performed.

After analysis was performed, it was seen that determination coefficient (R Square) showed 0.163 score. It means, the regression modeling obtained explained 16.1% of dependent variable variant from duration of wound healing process and p-value score = 0.001 meant 5% alpha. We could declare that the regression modeling was fit to the existing data. Supported by fulfilled auto correlation assumption and homoscedasticity assumption and collinearity test, the regression equation obtained was:

Duration of Wound Healing Process = 9.17 - 0.643 dressing type + 0.029 age -5.57comorbidity+2.037nutrition status-4.238 mobility+7.503 medicine consumtion

This equation model could estimate the duration of wound healing process affected by the confounding factors after being controlled by nutrition status. The illustration of wound healing process duration is described as follows: Individuals using PHMB, at the age of 52 years, no comorbidity, good nutrition status, mobile, on average they will heal 12 days faster compared to those using DACC; Individuals using PHMB, at the age of 52 years, no comorbidity, poor nutrition status, mobile, on average they will heal 15 days longer compared to those using DACC with poor nutrition status; Individuals using DACC, at the age of 52 years, no comorbidity, good nutrition status, mobile, on average they will heal 14 days faster compared to those using PHMB with poor nutrition status; Individuals using DACC, at the age of 52 years, no comorbidity, poor nutrition status, mobile, on average they will heal 16 days faster compared to those using PHMB with poor nutrition status.

Discussion

The average value of duration of ulcer retinopathy feet in the process of healing of a wound is 13.98 days as opposed to the use of other types of dressings.

Dressing Type related to the Duration of the Wound Healing Process

DACC dressing type utilization is more effective to the duration of wound healing process in diabetic foot ulcer patients with an average score of the duration of wound healing process 7.76 days compared to PHMB dressing type utilization (Butcher, 2014). The duration of wound healing process in general can be short but the healing process in diabetic foot ulcer needs longer time in certain phases because there can be several difficulties such as wound infection and chronic condition wound. Those things extend the inflammation phase of wound healing because the inflammatory agent in a choric wound is higher than in an acute wound (Soep, 2015). Research claims that a diabetic foot wound care needs longer time and multidiscipline therapy such as to control blood sugar level and revascularization (Semadi & Irawan, 2017).

Inflammation management in wound care must also be considered as to how the inflammation process does not extend to infection. The activity to control infection might be conducted by choosing the proper wound care solution and antimicrobial dressing on the wound (Arisanty, 2013). Silver type dressings have an effect and destroy microorganisms faster than oligodynamic. The result of a research by Indrayati (2018), stated that there was a significant difference between hidrophobic (DACC) and silver with p-value score 0.01 with significance level <0.05. Eberlein (2012) claimed that PHMB and silver were both effective to reduce the pain and bacteria. PHMB as a strong base in the bactericide, binds to phosphate negatively charged on the phospholipid bacteria, destroys the outside and inside of a cell wall bacteria through the permeability of bacteria and removes the cytoplasm of a cell by means of osmosis (Kurnia, Sumangkut, & Hatibie, 2017). PHMB treatment of injuries is used to speed up or encourage granulation of tissue and reduce the risk of infection. DACC works by binding and disabling bacteria or microorganisms, so bacteria can be uplifted in the turn of the dressings, which can speed up the process of healing of a wound. DACC does not cause bacteria resistance, is not cytotoxic, is safe to be used in the long run, and does not cause allergic reaction (Febriani, 2018).

Age related to the Duration of the Wound Healing Process

Human has physiological changes that decrease drastically quicker after the age of 49. The wound healing process will be longer along with the age. The affected factors were the derivation of the elasticity amount and the reduction of the collagen regeneration process because of the cell metabolism derivation. Inelastic skin will decrease the cell regeneration capacity when the wound will and start to close so it might retard the wound healing (Bahri, 2014). The age factor is determined extremely significant to diabetic ulcer incident rate. The elderly group (45->90 years old) have a high risk to diabetic ulcer as does the late adult group (35-44 years old) (Arisanty, 2013).

The result of this research was in line with that performed by Tanujiarso and Lestar (2020) that 72.7% of diabetic ulcer patients above 50 years had longer wound because of the decrease of amount of skin elastin and the reduction of collagen regeneration process from aging. It is found that

70% of diabetic ulcers in elderly will have constraints and will take longer in the healing process because the life quality of older patients with diabetic ulcer is lower compared to the younger patients related to their better physical condition (Utami & Agrina, 2014).

Comorbidity related to the Duration of the Wound Healing Process

The wound healing is affected by comorbidity such as diabetes, heart disease, kidney disease and blood vessels disorders. The condition of the diseases aggravates the cell work in wound healing because oxygen and nutrition will be prevented reaching to the wound section. It is necessary to perform collaboration to overcome the cause and the complication during the wound healing process. The cells' heavy work might affect the circulation so the duration of wound healing process will be longer compared to normal circulation. An abnormal circulation might lead to the oxygenation reduction because of the constriction. This constriction causes the reduction of blood volume which will lead to constriction phase and the reduction of oxygen and nutrition supply for wound healing (Arisanty, 2013).

Effect of moist wound healing technique on diabetes mellitus patients with diabetic ulcer at Dhoho Ward in RSUD Prof Dr. Soekandar Mojosari showed that there were four diabetes mellitus respondents with diabetic ulcer who had other comorbidity, which is anemia with wound regression (57.1%) (Wahyuni, 2016). According to Rakhmawati, Purnamawati, and Jumaiyah (2021), circulation might be one of the most important factors that affect the wound healing pace. Inappropriate circulation might become a flow disturbance in blood vessels so the tissue will have less oxygen. In the healing context, when the tissue has less oxygen, it will lead to hypoxia. A proper circulation is highly needed to maintain an adequate duration of the wound healing process.

The result of a research performed by Rodriguez, Felix , and Woodley (2008), mentioned that circulation was related to wound healing; inappropriate circulation causes oxygen absence which affect the healing wound. Another research by Sukarmin (2016) declared that there is a relation between circulation and retardation of diabetic foot wound healing.

Nutrition Status related to the Duration of the Wound Healing Process.

The characteristic of nutrition status was counted in accordance with Body Mass Index (BMI) which is a mathematic formula declared as body weight (in kilograms) divided by body height square (in meters). The utilization of this formula might only be applied to those at the age of 19 to 85 years, with normal back spine, not an athlete nor a body builder, and not being pregnant nor breast feeding (Arisman, 2011).

The nutrition and food supply affects highly to wound healing. Poor nutrition will lengthen the duration of wound healing process and even cause an infection (Arisman, 2011). The nutrition needed and important are *amino acid, fat, carbohydrate, vitamins (C, A, B complex, D, K, E), zinc, Fe, magnesium* and water. Triwibowo (2014), declared that to hasten the duration of the gangrene wound healing process, it is necessary to fulfill the nutrition demand. Another research by Molnar, Underdown, and Clark (2014), "*Nutrition and Chronic Wounds,*" stated that every aspect of chronic wound was identical to nutrition support so it must be optimal to the patient needs.

Mobility related to the Duration of the Wound Healing Process.

Movement disorder can restrict blood flow from and to peripheral. The disturbed blood flow might be caused by a pressure or a friction with foreign objects. If it happens in capillary blood vessels it could cause a local tissue necrotic. To make the circulation function efficient, mainly in lower extremity venous, movement or mobility is necessary (Ekaputra, 2013).

According to Arisanty (2013), the bad condition of wound might be caused by blood flow disturbance. The blood flow from and to peripheral will be obstructed because of mobility disturbance. Dwi et al. (2012) declared that in 25 people (64.1%) with mobility and 14 people (35.9%) without mobility there was a relation between mobility to the duration of wound healing process in diabetic ulcer.

Medicine Consumption related to the Duration of the Wound Healing Process.

Diabetic foot ulcer is an open wound on skin surface or mucous membrane that might be invaded by germs, so it creates infection and requires an antibiotic treatment. An inappropriate antibiotic option might cause an ulcer that does not heal soon and harms the patient. The evaluation on antibiotic accuracy declared 100% indication accurate, 100% patient accurate, 42% medication accurate, and 61.9% dosage accurate (Pradipta et al., 2016). Medicine therapy has a positive effect and differs from those with antibiotic type, which affects the wound healing. As claimed by Sussman and Bates-Jensen (2012), antibiotic consumption in the long term might suppress the wound healing level. A biofilm produced by bacteria creates antibiotic resistance in ulcer and gangrene. Biofilm might prevent antibiotic penetration and detain macrophages phagocytic activity. The antiphagocytic is developed in biofilm matrix and the colony formed in biofilm matrix might facilitate a resistance to genetic material transfer horizontally and genetic expression changes (Murali et al., 2014).

Conclusions

From the bivariate analysis result, the fastest duration of wound healing process was by using DACC dressing type. The fastest was three days

to 19 days maximum. The respondents' average age was 49.62 years. It showed that all the respondents were elderly. Most of the respondents had comorbidity, proper nutrition status, mobile and consumed medicine which was 25 people (59.5%). Most of the respondents' nutrition status was good, 22 (52.4%). Most of the respondents had mobility, 28 (66.7%). Most of the respondents consumed drugs, 32 (76.2%).

There was an average difference in the duration of wound healing process between PHMB therapy and DACC. There was a relation among age, comorbidity, nutrition status, mobility and medicine consumption with the duration of wound healing process in diabetic foot ulcer patients at Bekasi Hospital. The DACC dressing type was more effective to the duration of wound healing process compared to PHMB dressing type and the most dominant variable affecting the duration of wound healing process was comorbidity and mobility after controlled for nutrition status confounding factor.

Declaration of Interest

The authors declare no conflict of interest

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Development and psychometric properties of the transphobia scale among Indian adolescents

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Abstract

Background: Most of the studies employed in the concerning area use foreign scales or translated versions for measurement of transphobia. It is really unfortunate a democratic country like India does not possesses any standardized scale to measure the transphobia of adolescents.
Purpose: Therefore, this study includes the development and validation of a scale for the assessment of transphobia in Indian adolescents.
Methods: A total 516 students of CBSE school aged 14-16 years were sampled. The items for the preliminary transphobia scale were drawn after interviewing the adolescents, consultation with a reference group and review from existing standardized scales. A total 516 participants were assessed for psychometric properties of the scale. Criterion validity was evaluated by using the ATTMW (attitude toward transgender men and women) Scale.
Results: Exploratory Factor Analysis (EFA) revealed six factors accounting for 65.30% of observed variance. The final 31-item scale contained six factors: Interpersonal Ease, Gender Prejudices, Gender Obstinacy, Human Values, Gender Stereotype and Gender Abuse. Transphobia scale was highly reliable in terms of internal consistency (Cronbach's alpha 0.927). Criterion validity with the ATTMW was statistically significant.
Conclusion: As the conclusion of the study, the Indian transphobia scale can be used as a reliable and valid tool for the measurement of transphobia for Indian adolescents.

Keywords: development; reliability; transphobia scale; validity

Introduction

The term 'gender' has a Latin origin with the word 'genus' that means kind or race. The gender is expected to be masculine, feminine and transgender. Transgender are the gender non confirming people who do not put themselves into the binary status of the gender identification. There lies a wide range of binary identities that can come under this category (Hill & Willoughby, 2005). The Supreme Court of India acknowledged transgender individuals as "The Third Gender," alongside male and female, in April 2014. The Constitution of India now identifies the third gender category and preservers their constitutional rights through the laws made by the Indian parliament. One of the transgender categories identified as Kinnars are observed to take part in individual ceremonies such as during wedding, child birth, etc. Some people believe that the transgenders possess special divine powers to bless or curse somebody. Sometimes this ritual transforms into overpowering or blackmailing the common public by transgenders or converts into fear, hate or bullying toward the third gender people. As a consequence to this, the whole transgender community faces prejudice (Sterzing et al., 2017; Toomey et

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al., 2010; de Vries et al., 2016). The worst part of this has been observed over the transgender children and adolescents (Koken et al., 2009). As per the study conducted by Factor and Rothblum, most of the transgender children have to face discrimination and harassment from their families as compared to their non-transgender siblings (Factor & Rothblum, 2007). Such a situation and societal mentality forces the transgender people to tolerate and compromise according to the assigned sexual identities of the society and pursue their occupations. Such a suppression sometimes generates other forms of transgender behaviors such as cross-dressers.

Transphobia can be conventionally defined as a sense of fear, hate and disgust toward gender non-conforming people. The attitudinal discrimination toward a transgender person, that does not have any logical relevance, can be known as transphobia. Morrison et al. (2017) reported that the prejudice against transgender people is prevalent and can cause malicious effects on the physical and psychological health of those targeted.

Researches reveal the commonality of the abuse and misconduct with the transgender people. As per the statistics, about 20% of the transgender respondents reported hitting or other abusive reactions from the common public due to their trans status (Ellis et al., 2016). Sexual minority stigma can damage the mental well-being, but very few researches are available that measure the transgender-identity stigma among transgender (male or female) in India (Chakrapani et al., 2017). Therefore, there is an important need to reduce the transphobia among adolescents. In the current scenario, various transphobia scales were identified (Morrison et al., 2017), but only few reported content validity. Most of the researchers did not report sufficient information about item generation and refinement, scale dimensionality and psychometric properties. On the other hand, there is not any scale developed to measure transphobia in an Indian context. In India, most studies employed foreign scales or translated versions and no dedicated scale has been developed and validated in the Indian population. Morrison et al. (2017) recommended for development and validation of a transphobia scale. Therefore, in the current study we developed and validated scales to measures the transphobia according to the characteristics of adolescents in the culture of India.

Materials and Methods

Design

Cross-sectional research design was used in the present study. As many as 516 participants were selected through random sampling method from high school of CBSE (Central Board of Secondary Education) pattern. All participants were assessed on a transphobia scale and an already developed scale called Attitude Toward Transgender Men and Women Scale (ATTMW).

Research Instruments

Attitudes toward Transgender Men and Women (ATTMW)

ATTMW scale was developed to measure attitudes toward transgender individuals. A 24-item ATTMW scale was validated as a reliable scale (Chakrapani et al., 2017). EFA revealed two non-identical 12-item subscales: 1. attitude toward Transgender Men (ATTM) and 2. attitude toward Transgender Women (ATTW). The convergent, discriminant, predictive and concurrent validities of the ATTMW were also analyzed. The reliability of the combined ATTMW scale was high, $\alpha = 0.98$, $\omega h = 0.87$.

Data Collection

Construction of the Scale: This scale was developed according to the scale development process suggested by DeVellis (2016). Scale development was performed in two phases: (phase I: Development of the draft of transphobia scale and phase II: Assessment of reliability and validity of the transphobia scale).

Phase I: Development of the draft of transphobia scale:

The items for the draft of transphobia scale were selected from the review of related scale, research papers, books and interviews of reference groups.

I: Item selection from review of literature

To find out the items for the transphobia scale, research papers, books and 83 existing scales were reviewed; the details of the scale were reported in systematic review of Morrison et al., (2017). Essential components of transphobia were discussed with experts and 86 common items were observed from the review of existing scales, books and research papers.

II: Item selection from interview

For the collection of items for transphobia scale, 300 high school students' of Hindi and English medium were assessed on ATTMW. Fifty adolescents were selected for in-depth interview, and considered a score above percentile of 75 on ATTMW. Qualitative information related to the transphobia was gathered; 46 items observed in the responses of the adolescents interview were further included for scale.

III: Focused group discussion (FGDs) with experts

To identify transphobia behavior, experts were asked about the importance of 132 items. Experts were asked to assess each item for difficulty and ambiguity. To evaluate whether items were relevant, clear and essential, experts were given a sheet with the following four inquiries: 1) how relevant the question is); 2) how clear the wording is); 3) how essential the question is). For the relevancy scale, a 4-point Likert scale was used and responses include: 1) not relevant, 2) somewhat relevant, 3)

Table 1. Demographic Information of Participants

Variable	Frequency	Percent
Gender		
Female	216	41.9
Male	300	58.1
Age		
14	56	10.9
15	396	76.7
16	64	12.4
Mother Occupation		
Home Maker	408	79.1
Private Job	12	2.3
Business	20	3.9
Government Job	72	14.0
Father Occupation		
Private Job	44	8.5
Business	192	37.2
Government Job	112	21.7
Monthly Income		
6000-10000	4	0.8
10000-30000	4	0.8
30000 and Above	508	98.4

Table 2. Rotated Component Matrix

Statement	Component						Communalities
	Interpersonal Ease	Gender Prejudices	Gender Obstinacy	Human Values	Gender Stereotype	Gender Abuse	
An acquaintance of mine told me that she is transgender, I would feel uncomfortable being with her.	0.717						0.667
I would feel uncomfortable being alone with a transgender in some place	0.714						0.597
If I come to know that someone is transgender then I would prefer to stay away from them.	0.682						0.732
I am not comfortable to be in a group of transgender persons.	0.663						0.625
If I found out that that someone is transgender, it will be very uncomfortable for me to be friends with them.	0.658						0.629
If I come to know that my neighbor is transgender then it is a matter of concern for me	0.647						0.574
I would object to sitting in an auto/taxi with a transgender.	0.634						0.656
I would not like if my school welcomes transgender persons	0.628						0.619

Cont. Table 2. Rotated Component Matrix

I would feel uncomfortable inviting a transgender to my home for a meal.	0.544				0.643
I would like to go to another doctor if I know that my doctor is transgender	0.460				0.560
It is unacceptable to me that any transgender stays at my house on rent.	0.474				0.609
If a transgender comes to my house asking for work, I will refuse	0.438				0.727
I don't like boys who dress like girls		0.824			0.743
It is unusual for women to be masculine		0.684			0.732
If a woman presents herself in public as a man, then it is morally wrong.		0.569			0.573
Men who behave like women should be ashamed of themselves		0.501			0.626
Everyone should behave according to their gender by birth.		0.500			0.524
Children should play with toys according to their gender			0.741		0.758
There is nothing wrong with making fun of people who don't dress according to their gender			0.727		0.683
Men who don't resist are weak			0.631		0.556
If any of my teachers are transgender, it is not acceptable to me			0.542		0.588
Transgender persons are mentally ill.			0.405		0.710
Transgender persons should not get any reservation.				0.625	0.656
Transgender persons are human beings with less struggle/ hard work than the rest of us				0.589	0.625
I feel uncomfortable talking about problems faced by transgender persons				0.536	0.642
God has created two and only two genders				0.748	0.717
It is unusual for a person not to be either a woman or a man.				0.636	0.704
All human beings are female or male; there can be no position between				0.480	0.592
I believe that transgenders are not important people.					0.417 0.766
I like seeing transgender persons being abused.					0.789 0.732
There is no need to treat transgender persons with respect					0.559 0.679

Table 3. Total Variance Explained

Component	Total items	Initial Eigen values			Extraction Sums of Squared Loadings		
		Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Interpersonal Ease	12	13.074	42.175	42.175	13.074	42.175	42.175
Gender Prejudices	05	2.125	6.853	49.029	2.125	6.853	49.029
Gender Obstinacy	05	1.566	5.051	54.080	1.566	5.051	54.080
Human Values	03	1.302	4.201	58.281	1.302	4.201	58.281
Gender Stereotype	03	1.143	3.687	61.968	1.143	3.687	61.968
Gender Abuse	03	1.033	3.333	65.301	1.033	3.333	65.301

Table 4. Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I would feel uncomfortable inviting a transgender to my home for a meal.	58.9826	417.526	0.613	0.648	0.951
I am not comfortable to be in a group of transgender persons.	58.4870	413.094	0.635	0.635	0.950
If I found out that that someone is transgender, it will be very uncomfortable for me to be friends with them.	59.0783	414.915	0.645	0.617	0.950
If I come to know that my neighbor is transgender then it is a matter of concern for me	59.2087	421.553	0.576	0.590	0.951
If I come to know that someone is transgender then I would prefer to stay away from them.	59.2261	415.264	0.723	0.773	0.950
If a transgender comes to my house asking for work, I will refuse	59.1652	419.894	0.605	0.623	0.951
I would feel uncomfortable being alone with a transgender in some place	58.3391	412.980	0.619	0.607	0.951
I would not like if my school welcomes transgender persons	59.4870	421.796	0.597	0.588	0.951
An acquaintance of mine told me that she is transgender, I would feel uncomfortable being with her.	58.9826	411.421	0.697	0.679	0.950
I would like to go to another doctor if I know that my doctor is transgender	59.1130	415.294	0.675	0.590	0.950
If any of my teachers are transgender, it is not acceptable to me	59.4435	419.056	0.616	0.581	0.951
I would object to sitting in an auto/taxi with a transgender.	59.0783	411.108	0.731	0.750	0.949
It is unacceptable to me that any transgender stays at my house on rent.	59.1826	412.466	0.704	0.747	0.950
All human beings are female or male; there can be no position between	59.2783	413.343	0.586	0.557	0.951
God has created two and only two genders	59.5652	421.458	0.536	0.585	0.951
It is unusual for a person not to be either a woman or a man.	59.1217	418.073	0.578	0.576	0.951
Transgender persons are mentally ill.	59.7739	425.545	0.681	0.740	0.950

Cont. Table 4. Item-Total Statistics

I don't like boys who dress like girls	58.6783	413.501	0.543	0.611	0.952
If a woman presents herself in public as a man, then it is morally wrong.	59.2261	416.264	0.630	0.536	0.950
Men who behave like women should be ashamed of themselves	59.4174	416.526	0.684	0.642	0.950
It is unusual for women to be masculine	59.2957	413.333	0.649	0.666	0.950
Children should play with toys according to their gender	59.7217	422.764	0.587	0.705	0.951
There is nothing wrong with making fun of people who don't dress according to their gender	59.5217	419.936	0.592	0.635	0.951
Men who don't resist are weak	59.4609	426.496	0.462	0.518	0.952
Everyone should behave according to their gender by birth.	58.8348	414.385	0.564	0.602	0.951
I believe that transgenders are not important people.	59.6522	419.492	0.625	0.743	0.950
There is no need to treat transgender persons with respect	59.8174	429.308	0.575	0.641	0.951
I like seeing transgender persons being abused	59.8348	433.437	0.402	0.520	0.952
I feel uncomfortable talking about problems faced by transgender persons	58.9478	411.945	0.672	0.637	0.950
Transgender persons are human beings with less struggle/hard work than the rest of us	59.5130	420.761	0.633	0.665	0.950
Transgender persons should not get any reservation.	59.6087	421.714	0.636	0.597	0.950
					Cronbach's alpha =0.927

Table 5. Validity

		Transphobia	ATTM	ATTW	ATTMW
Transphobia	Pearson Correlation	1	0.477**	0.521**	0.515**
	Sig. (2-tailed)		0.000	0.000	0.000
	N	129	129	129	129
ATTM	Pearson Correlation	0.477**	1	0.809**	0.977**
	Sig. (2-tailed)	0.000		0.000	0.000
	N	129	129	129	129
ATTW	Pearson Correlation	0.521**	0.809**	1	0.916**
	Sig. (2-tailed)	0.000	0.000		0.000
	N	129	129	129	129
ATTMW	Pearson Correlation	0.515**	0.977**	0.916**	1
	Sig. (2-tailed)	0.000	0.000	0.000	
	N	129	129	129	129

**.is significant at the 0.01 level (2-tailed).

quite relevant, and 4) very relevant. Ratings of 1 and 2 are considered item invalid while ratings of 3 and 4 are considered item valid. A 3-point Likert scale was used for the clarity and essentiality scale. The clarity scale was: 1) not clear, 2) item needs some revision; and 3) very clear, and for essentiality: 1) not essential; 2) useful, but not essential; and 3) essential (Armstrong et al., 2005; Zamanzadeh et al., 2015). Individual questions were edited and redundant questions were eliminated by a group

of experts of psychology professor (n=2) education professor (n=2), statistician (n=1) and counselor (n=1). An initial pool of 32 items was derived. The responses to all items were graded on a five-point scale.

Phase II: Assessment of reliability and validity of the transphobia scale

For the assessment of the reliability and validity, transphobia scale and ATTMW scale were administered among 516 students. The final items for the scale were selected by statistical methods as follows (1) Pearson's Correlation coefficient: Any item with a Pearson's correlation coefficient <0.30 with the total scale score was eliminated. Corrected item-total correlations of scale exceed the accepted cutoff of 0.30 indicating each item was related to the overall scale, (2) Exploratory Factor Analysis (EFA). Any item with a factor loading<0.40 was eliminated (Kumar et al., 2020, 2021; Iyengar et al., 2021; Sahu et al., 2022; Shrivastava et al., 2019, 2022). After the EFA, six factors consisting of 31 items were derived.

Ethical Approval

The methods of the present study were carried out in accordance with the STROBE statement (Vandenbroucke et al., 2014).The purpose and implication of the survey were explained to the students and their parents. Written informed consents were obtained from all participants and their caregivers. The research methodology of the study was evaluated from the departmental ethics committee (PhD/19/EDU/09).

Data Analysis

Descriptive analysis was used for reporting demographic characteristics. The correlation of transphobia scale with the ATTMW and continuous socio-demographic variables was evaluated using the Pearson's correlation. Significance level was considered at P< 0.05. All the statistical analyses were performed using SPSS 16.0.

To evaluate the adequacy of exploratory factor analysis (EFA), the Kaiser-Meyer-Olkin (KMO) test was calculated. EFA was used with an Eigen value >1.0 to examine the number of factors in each scale. The Varimax rotation was used to achieve rotated factor loadings for the scale. Reliability was measured in terms of internal consistency using Cronbach's alpha coefficient, Spearman-Brown's and split-half coefficient. Validity of scales was assessed by ATTMW using Pearson's correlation coefficients.

Results

Characteristics of Participants

There were 300 male and 216 female included in this study for exploratory factor analysis EFA. The number of participants under the age of 15 was 452 for EFA. With regard to education level, all participants were selected from the 9th class, all participants were from CBSE school education, of the participants all were urban area. The detailed characteristics of the participants are reported in Table 1.

Construct validity

Before conducting the exploratory factor analysis (EFA), we analyzed the Kaiser–Meyer–Olkin (KMO) test to measure the sampling adequacy and the Bartlett's test of sphericity to investigate the factor ability of the data. KMO value of results was high (almost 0.85), indicating high sampling adequacy for EFA and a significant Bartlett's test of sphericity ($p < 0.001$) indicated sufficient inter-item correlations for analysis.

We conducted EFA of the preliminary version of the 32-item transphobia scale to uncover the internal structure of the scale. During EFA, item number 13 was found to lower consistency with the scale, and was excluded. EFA was then again performed with the remaining 31 items. As a result of these analyses, a six-factor model was developed (see Table 2). As a result, the final version of the transphobia scale consisted of 31 items in six factor model, and this model accounted for 65.30% of total variation (see Table 3). Total transphobia status of the participants was explained with 65.30% by this scale. A total six factors were found including 12 items with Interpersonal Ease; 05 items with Gender Prejudices; 05 items with Gender Obstinacy; 05 items with Human Values; 3 items with Gender Stereotype and 03 items with Gender Abuse.

Reliability

The Cronbach's alpha was found for Interpersonal Ease=0.917; Gender Prejudices=0.814; Gender Obstinacy=0.794; Human Values =0.718; Gender Stereotype=0.722 and Gender Abuse-=0.734. The Cronbach's alpha of the overall transphobia scale was 0.927; suggesting a high degree of internal consistency. The corrected items correlations between all items ranged from r = 0.402 to r = 0.731 (Table 4).The scales had good reliability. We estimated item quality through item inter-correlations. The analysis showed that correlations of individual item with total scale (all items) were high. This finding is indicative of construct validity.

Validity

The correlation of transphobia scale with ATTMW was analyzed. The Pearson's correlation coefficient of the transphobia scale with ATTM (r= .477), ATTW (r= .521), and ATTMW (r= .515) scores were significant, suggesting positive correlation. The relationship of transphobia scale with the ATTM, ATTW and ATTMW are reported in Table 5.

Discussion

The main objective of the study is to develop and validate a standardized tool for gauging and quantifying the transphobia in India's adolescent

population. As per the reviews made by the researcher, the above is the first attempt to develop and validate scales to measure transphobia among adolescents in the Indian population. This study may offer an empirical support for the reliability and validity of the Indian transphobia scale. Development was based on common component analysis.

Factorial structure of the scale was examined through exploratory factor analysis (EFA). In the final round, we minimized a 31-item scale to a 32-item scale due to low factor load. According to the EFA there seems to be six principal factors in the scale which explains 65.30% of the variable variance:

Interpersonal Ease: The first factor around which the 12 of the 31 items was centered was named as Interpersonal Ease. The functional explanation of the term suggests that it is a measure of comfort of a person who is coming in direct personal contact with a transgender. Almost all the possibilities have been explored under this factor. A similar factor has been studied in a research article by Flores, (2015). The interpersonal contact with transgender people has a positive correlation with attitudes toward transgender people (Bramlett, 2012; Dyck et al., 2014; Garner, 2013; Gregory et al., 1993; Herek & Capitanio, 1996; Lewis, 2011).The correlation between attitudes on transgender rights and interpersonal transgender contact is positive, indicating that interpersonal contact operates as expected (Flores et al., 2015). In her dissertation the researcher includes items to identify their contact experience with transsexual individuals (Claman et al., 2009). As per the hypothesis of this study, a person who has even a single experience with a transgender individual (i.e., transsexual or cross-dresser) will have more positive attitudes toward the transgender population than the person who does not have such exposure. About 35% of the sample population reported to have at least a single contact with a transgender person and they showed more positive attitudes as compared to those who had not had contact. The finding of this study is consistent with studies on both GLB attitudes (Cotten-Huston & Waite, 2000; Herek, 1988) and transgender attitudes (Hill et al., 2005) that have exposure to transgender people and display more affirmative attitudes (Claman et al., 2009).

Gender Prejudices: The five items were found toward another factor named Gender Prejudice. This term can be functionally defined as a strong unreasonable biasness toward a specific gender. This factor explores the unfair opinion making in the domain of gender norms. In an extensive global study Winter et al.(2009) studied the similar factor with the term trans prejudice in seven countries. Five factors were identified mental-illness, denial-women, social-rejection, peer rejection, sexual-deviance), mental-illness (Winter et al., 2009). King et al. introduced the term trans prejudice as the biased, stereotyped and unfair treatment of transgender people (King et al., 2009). The results of the study conclude that the interaction with a transgender person is significantly associated with the attitudes measured by the scale; decreased social distance, decreased social discrimination, and decreased trans prejudice, increased awareness of discrimination against trans people, increased support for equal opportunities, increased support for post-operative transsexual civil rights, and increased support for anti-discrimination legislation (King et al., 2009).

Gender Obstinacy:

This factor has been named here as Gender Obstinacy. Five items were found. Results suggest that previous contact with trans people can be an effect for attitudes. The factor analysis displayed the association of five items that show certain type of stubborn opinions toward transgender people. This factor has been named here as Gender Obstinacy. One of the examples of such is “Children should play with toys according to their gender.”

Human Values: Three of the items have been attributed to the factor named Human Values. Human values are the desirable qualities that should be displayed by a human being. Functionally this factor explores the inherited values of a person for transgender people.

Gender Stereotype: Gender Stereotype remains another factor with three iterations. Stereotype is a rigid idea of a person or a thing that is often not true. As per Merriam-Webster Dictionary, stereotype is an unvarying mental picture of some person or a construct that represents an over generalized opinion, biased attitude, or irrational judgment. The young transgender women were found to display more of a depressed attitude in association with the psychological abuse as compared to the older transgender women.

Gender Abuse: Gender Abuse is the last factor with three items that can be functionally defined as the mental, verbal or physical harassment caused due to stereotype/prejudiced attitude toward a transgender person. As per a study done by Nuttbrock et al. (2014), gender-related violence acts as a disaster for the mental health of transgender persons. A significant association of psychological and physical gender maltreatment has been identified with major depression during follow-up of the study.

The analysis examined item quality. The correlations between all items ranged from r = 0.402 to r = 0.731 as expected. This finding is indicative of construct validity. The transphobia scales had good internal consistency. Specifically, the Cronbach’s alpha index for the scale was α= 0.910.The analysis also showed that by deleting some items, we could not increase the reliability of the overall scale. In the end we decided to not proceed with the deletion of items.

The study also addressed the criterion validity using as criteria specific variables based on recent bibliography. As expected the transphobia was positively correlated to the Attitude Toward Transgender Men and Women measure. All correlations were positive and statistically significant.

These results are indicative of the validity of the scale in the Indian population.

Regarding the limitations of this study, we should mention that reliability indexes were not calculated using test-retest methodology. Moreover, all validity measures were concurrent while we could also estimate validity measures over a period of time and regarding future results. The present study provides useful insights regarding the utilization of the transphobia scale in future studies in both Hindi or English speaking populations and it could enhance attention on research in transgender.

Conclusion

The present study developed a psychometrically-validated scale to assess the structure of transphobia, and it supports the application of the transphobia scale in school settings. Future research should analyze the validity and reliability of the transphobia scale in a different culture of population.

Declaration of Interest

There is no conflict of interest of this study.

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Analysis of religious coping relationships with family resilience in utilizing socio-economic resources during the covid-19 pandemic

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Abstract

Background: Religious coping has a very important role in overcoming difficult problems in the family.
Purpose: The purpose of this study was to determine the relationship between religious coping with family resilience in utilizing socioeconomic resources during the COVID-19 pandemic.
Methods: The research design used was analytical descriptive with a cross-sectional approach. The respondents in this study were 242 villagers in East Java Province. Data were collected by SWBS for religious coping and FRAS for family resilience. Data analysis used logistic regression.
Results: Factors that influence family resilience in utilizing socioeconomic resources involve religious coping. Families that have adequate religious coping will have a greater opportunity to have resilience in communication and problem-solving compared to families with inadequate religious coping (OR: 1.081; 95% CI: 1.038 – 1.127).
Conclusion: Family resilience in utilizing socioeconomic resources is strongly influenced by religious coping factors. Strengthening the community with a religious approach is needed to support the family's line of defense against this pandemic condition.

Keywords: COVID-19; religious coping; resilience; utilizing socioeconomic resources

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Introduction

The impact of the COVID-19 pandemic is not only on the spiritual aspect but also on the social and economic factors of the community. During this COVID-19 pandemic, many people are experiencing an economic crisis as a result of declining incomes (Kansiime et al., 2020). Socioeconomic problems during the COVID-19 pandemic include limited food (77.1%), disruption of education (86.1%), mental stress due to social stigmatization (62%), and job loss (63.1%) (Haddad et al., 2021; Nuwematsiko et al., 2022). This matter results in as much as 40% psychological stress, such as fear, anxiety and emotional stress (Siette et al., 2021). In addition, Sun et al.'s (2021) research in China reported that people experienced traumatic stress (67%), depressive symptoms (47%), and increased suicidal ideation (20%). Since the COVID-19 pandemic, 22.6% of people in China have suffered from anxiety disorders (Chen et al., 2021).

Decreased income can affect psychological stress in the family caused by conditions of economic decline (Kansiime et al., 2020; Nuwematsiko et al., 2022). On the other hand, there is a panic buying phenomenon that causes the price of basic commodities to rise (Nicola et al., 2020). When everyone experiences constant stress with the high price of basic commodities, it causes spirituality in the family to change as economic conditions deteriorate

(Zarrouq et al., 2021). Individuals who experience stress also find it has an impact on their faith (Büssing et al., 2020). Psychological pressure due to socioeconomic decline can be overcome with the support of religious coping (Hassan et al., 2021). In the social aspect, there is stigmatization by the community toward people who are confirmed to have the COVID-19 virus (Chew et al., 2021). This causes mental stress for the sufferer, which can weaken the body's immunity and slow down the healing process (Yu et al., 2021). However, according to Tao et al. (2022), there is a role for religious coping and environmental support that supports the spirit of sufferers to recover. In this case, proper coping and support from people around can affect the healing of patients with the COVID-19 virus.

Family resilience that fails to maintain family socioeconomic conditions can result in decreased family resilience (Gayatri & Irawaty, 2021; Heo et al., 2021). During the COVID-19 pandemic, people who were affected both socially and economically chose to draw closer to God by praying and asking to make it easier to find income for their families (Desie et al., 2021). The higher the spiritual level of someone, the higher the well-being, both in personal and social relations (Borges et al., 2021). Individuals who have a high level of religiosity will interpret every event positively during the COVID-19 pandemic so that their lives will be more meaningful and avoid stress (Counted et al., 2018).

The lack of spiritual resilience in the family causes psychological and mental disorders, especially in people who live in poverty experiencing an economic downturn during this pandemic (Chirico & Nucera, 2020). As a result, when there is a pandemic, people flock to find the strongest grip, namely by seeking support from the creator (González-Sanguino et al., 2020). Since the COVID-19 pandemic, prayer search data experienced a drastic increase, up from about 30% from before the pandemic (Bentzen, 2020). A sense of security, and peace in asking for protection or safety during the COVID-19 pandemic, can be created with religious practices and religious coping (Braam et al., 2021).

A previous study conducted by Fatimah (2021), explained the influence of religious coping during the COVID-19 pandemic but did not explain the influence of religious coping on family resilience. Previous research by Riehm et al. (2021) found religiosity, spirituality, social support, and individual resilience have positive effects in dealing with the COVID-19 pandemic. This study aims to determine the influence of religious coping on family resilience in utilizing socioeconomic resources during the COVID-19 pandemic.

Materials and Methods

Design and participants

The research design used an analytic descriptive design with a cross-sectional approach. The research was conducted from December 2021 until February 2022. The population of this study is the entire community in the area of Taman Harjo Village, Singosari District, Malang Regency, East Java Province. The inclusion criteria: are (1) aged above or equal to 17 years; (2) able to be invited to communicate; and (3) willing to be research respondents. The research sample is Indonesian citizens in Taman Harjo Village, Singosari District, Malang Regency with a sample size of 243 respondents determined by G-Power version 3.1 with Z-Test, logistic regression, odds ratio 1.5, power of 80%, and probability error of 0.05. Sampling was done by non-probability sampling with an accidental sampling technique.

Measures

Independent variable

The main independent variable is religious coping. The data collection method is the Spiritual Coping Strategies Scale (SCS) questionnaire from Cruz et al. (2016). In this questionnaire, we use a 9-item questionnaire with a score range of 0 – 3 (0 = never, 2 = rarely, 3 = usually, to 4 = often). Some examples of questions listed in the questionnaire are; "How often do you do individual prayers? How often do you go to a place of worship to carry out worship? The lowest and highest scores for this questionnaire are 9 – 36. Furthermore, they are categorized into two, namely good (> median), and poor (<median). In addition to the main variable, there are other independent variables including age, education, family type, income, occupation, and religious coping. Age was categorized into six categories (1= 17 – 25 years; 2 = 26 – 35 years; 3 = 36 – 45 years; 4 = 46 – 55 years; 5 = 56 – 65 years; 6 = > 65 years). Education includes 0: no school; 1: SD; 2: Middle school; 3: high school; 4: PT. Family types are divided into nuclear family = 1; extended family = 2; and single parent = 3. Income is divided into two, namely: less than 3 million = 1; more than 3 million = 2.

Based on the reliability and construct validity tests (convergent and discriminant validity) analyzing factor loadings, Average Variance Extracted (AVE), Cronbach's alpha (CA) and Composite Reliability (CR), Dijkstra-Henseler's rho (RhoA), Fornell-Larcker criteria, and Heterotrait-Monotrait ratio (HTMT), the item used in this study is a good indicator. A full collinearity test was also performed to ensure that the model was free from general method bias.

Items from the loading factor can be accepted with a value greater than 0.7. The construction is considered reliable when the CA and CR values are greater than 0.70. RhoA for all constructs is above 0.70, indicating that the items are consistently reliable. In addition, the AVE values for all constructs also exceed the threshold of 0.50, confirming the strong convergent validity (Purwanto & Sudargini, 2021). Validity and reliability tests were conducted on 20 respondents who live in areas with the same

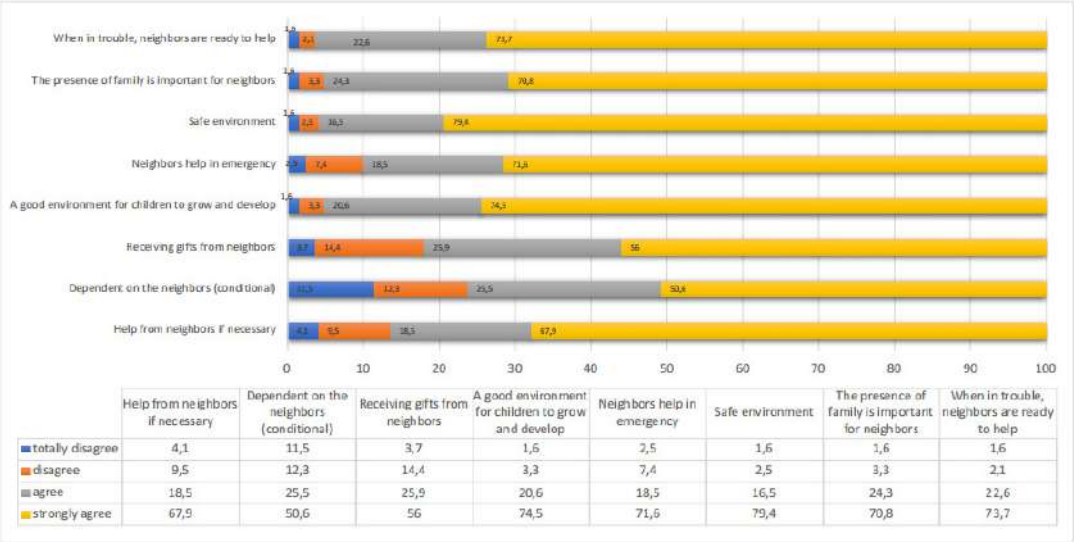
Table 1. Characteristics of Respondents (n = 243)

Characteristics	n	%
Age*		
17-25	19	7.8%
26-35	57	23.5%
36-45	56	23.0%
46-55	75	30.9%
56-65	27	11.1%
>65	9	3.7%
Education		
No school	1	0.4%
Elementary School	46	18.9%
Junior High School	55	22.6%
Senior High School	116	47.7%
College	25	10.3%
family type		
Nuclear family	162	66.7%
Extended family	60	24.7%
Single parent	21	8.6%
Income (IDR)		
<3 million	220	90.5%
>3 million	23	9.5%
Work		
Working	81	33.3%
Doesn't work	162	66.7%
Religious coping		
Poor	101	41.6
good	142	58.4
Family resilience in utilizing socio-economic resources		
Inadequate	115	47.3
Adequate	128	52.7

* age category based on criteria determined by the Indonesian Ministry of Health (2009)

Table 2. The final multivariate logistic regression model of family resilience in socioeconomic benefits

Variable	B	SE	Wald	p-value
Religious coping	0.078	0.021	14,157	0.000
Education	-0.231	0.148	2.429	0.205
Work	0.432	0.207	1.189	0.204
Age	-0.167	0.115	2.129	0.465
Family type	0.103	0.205	0.251	0.800
Income	-0.051	0.460	0.012	0.792
Constant	-3,866	1.069	13.087	0.000



	Help from neighbors if necessary	Dependent on the neighbors (conditional)	Receiving gifts from neighbors	A good environment for children to grow and develop	Neighbors help in emergency	Safe environment	The presence of family is important for neighbors	When in trouble, neighbors are ready to help
totally disagree	4,1	11,5	3,7	1,6	2,5	1,6	1,6	1,6
disagree	9,5	12,3	14,4	3,3	7,4	2,5	3,3	2,1
agree	18,5	25,5	25,9	20,6	18,5	16,5	24,3	22,6
strongly agree	67,9	50,6	56	74,5	71,6	79,4	70,8	73,7

Figure 1. Family resilience in utilizing socio-economic resources during the COVID-19 pandemic

characteristics as the study locations.

Dependent variable

The dependent variable of this study is family resilience in utilizing socioeconomic resources. The data collection method is the Family Resilience Assessment Scale (FRAS) questionnaire from Gardiner et al. (2019). In this study, we use eight question items including help from neighbors, depending on neighbors in certain situations, and others. The questionnaire uses a Likert scale of 1 – 4 (1 = disagree; 4 = strongly agree). The composite score is between 12 – 108. Furthermore, it is categorized into two, namely adequate (> median), and inadequate (<median).

Based on the results of the validity and reliability tests of the Family Resilience Assessment Scale that were carried out in a village with almost the same characteristics as the research location, namely in Karangploso Village, Malang Regency with the questionnaire filled by 20 respondents, Cronbach's alpha results on all scales (consisting of 54 items) is 0.96. Consisting of six subscales, we studied the one about utilizing Social and Economic Resources with USER results, = 0.85, in which there are eight items.

Procedure

The researcher designed the survey in the form of an electronic questionnaire using Google Forms, distributing these to respondents who have smartphones. Previously the respondent's cellphone number was stored and included in the research WhatsApp group. In addition to using electronic forms, researchers also printed out a questionnaire aimed to get more respondents. Furthermore, the researcher consisted of a team of seven members. Researchers collaborated with the village apparatus of Taman Harjo in assisting researchers in obtaining participants. Each member was accompanied by one village staff then divided into their respective areas in Taman Hardjo village to get respondents. The researcher collected the respondents in one place, the researcher then explained how to fill out the questionnaire and the respondents were given 30 minutes to fill out the questionnaire. Incentives were given to participants to encourage and thank them for completion and after 30 minutes, the questionnaire was collected. Then the researcher entered the results of the completed questionnaire and the data were then downloaded in Excel form. Excel data was input in SPSS.

Data analysis

All data were analyzed using SPSS software (Statistical Package for Social Science) version 2.1 (IBM USA). Descriptive analysis was used to identify religious coping, age, education, family type, income, occupation, and family resilience with frequency and percentage. Logistic binary analysis was used to select candidate variables. Variables with $p < 0.25$), included in the multivariate analysis model, were used to analyze the effect of candidate variables on family resilience in communicating and solving problems during the COVID-19 pandemic. The degree of freedom used is 95% with a standard error of 0.05.

Ethical considerations

This study received ethical approval from the Health Research Ethics Commission of the University of Muhammadiyah Malang with protocol number E.5.a/007/KEPK-UMM/I/2022. Participants provided written consent for participation before data collection.

Results

Characteristics of respondents the age of the respondents are mostly in the range of 46-55 years as much as 30.9%, with the last education level of the majority being Senior High School as much as 47.7%. Meanwhile, the type of family is dominated by the nuclear family by 66.7%. Most of the respondents earn less than 3 million rupiahs (90.5%), while the working population is 33.3%. Based on the results of collecting data it also shows that many of the respondents have good religious coping 58.4% and adequate family resilience in socioeconomic resources 52.7% (Table 2).

Figure 1 shows the resilience of families in utilizing socioeconomic resources during the COVID-19 pandemic in the form: most respondents (79.4%) strongly agree that their living environment is economically and socially safe. In line with this statement, it was also found that most of the respondents (74.5%) also strongly agreed that their environment supports the growth and development of children. Furthermore, most respondents (71.6%) stated that neighbors are an important element to assist in an emergency, and as many as 73.7% stated strongly agree that they can ask neighbors for help when they have economic problems. More than half of the respondents (67.9%) stated that under certain conditions they get help from neighbors when needed.

One factor that affects family resilience in utilizing social and economic resources is religious coping. Families that have adequate religious coping will are more likely to have resilience in utilizing resources social and economic resources compared to families with inadequate religious coping (OR: 1.081; 95% CI: 1.038-1.127) (Table 2).

The selection of candidates who entered the model was religious coping, education, and work with p-value < 0.25, respectively 0.000, 0.205, 0.204, while the variables were not included in the model because they had a p-value> 0.25, namely age (p: 0.465), family type (p:0.800), income (p:0.792). However, only religious coping was p<0.05.

Discussion

The results show that religious coping affects family resilience in utilizing socioeconomic resources. This can be seen from the test results which show a significant relationship between the two. Furthermore, the answers to the questionnaire also explained that families are very dependent on socioeconomic assistance from their surroundings, from their own families, neighbors, and the surrounding community. Studies by Molenaar et al. (2020) and Hossain et al. (2022) explain that the effect of the economic crisis due to the COVID-19 pandemic has an impact on high medical costs while many companies are laying off employees thereby increasing the economic crisis. According to some previous research (Harrop et al., 2020; O'Neill et al., 2021; Van Der Boor et al., 2020), the psychological pressure experienced due to economic demands during the pandemic increased mental and spiritual stress, so that an emotional and spiritual approach was needed.

To deal with stress due to the economic crisis that occurred during the COVID-19 pandemic, the use of religious coping has proven to be effective in increasing family resilience in overcoming the stress caused by the economic crisis (Abu Khait & Lazenby, 2021). This is similar to the research of about family welfare in India related to economic factors. The study proved that one of the coping methods used by families in maintaining family resilience is by strengthening spirituality, and by performing rituals that aim to pray so that they are closer to God to strengthen family resilience in the face of economic crises (Kabir et al., 2019). Thus, it can be concluded that families with adequate religious coping will have a greater chance of having resilience in social and economic use compared to families with inadequate religious coping.

Religious coping is very important; strong religious coping makes individuals feel they have a strong grip as a support in various conditions. On the other hand, during the COVID-19 pandemic, many individuals were affected by the economic crisis, and individuals who have weak religious coping will seek solutions that focus on stress and do not think about their mental and spiritual condition (Fatima et al., 2022). The majority of individuals with weak religious coping think about how to get money, whereas in the pandemic economic conditions have drastically decreased, which has an impact on all parts of the world, so finding income during the pandemic is not as easy as it was before. Difficulty generating income causes anxiety, depression, and stress.

The existence of religious coping has been proven to provide comfort and reduce stress in individuals (Pirutinsky et al., 2020). This is supported by Bentzen (2020) who explained that religious coping done by praying and asking God so that the COVID-19 pandemic would end soon was often done by the community during the pandemic. Meanwhile, individuals who do not use religious coping tend to have high levels of stress (Pirutinsky et al., 2020). With this, a weak spiritual level and high-stress levels have an impact on individual resilience, and decreased individual resilience has an impact on family resilience. Fatima et al. (2022) also mentioned that positive religious coping can improve the quality of life and individual optimism that took place due to the COVID-19 pandemic.

Based on the results of this study, work does not impact family resilience during the COVID-19 pandemic. During the COVID-19 pandemic, there were many terminations of work contracts by companies/factories, and this had an impact on family resilience (Pit et al., 2021). The loss of a job causes income in the family to drop dramatically to the point of causing a crisis of family resilience; if the

problem is not addressed immediately it can cause a psychological impact on the family (Ameis et al., 2020). In overcoming family psychological factors, religious coping is needed to create well-being in the family (Olashore et al., 2021). However, previous research has shown that work has no effect on family resilience during the COVID-19 pandemic. This is in line with the research (Toledano-Toledano et al., 2017; Xiao et al., 2021) which explains that there is no relationship between work and family resilience during the COVID-19 pandemic. On the other hand, social, religious, cultural, and mental health support greatly affects family resilience during the COVID-19 pandemic (Plenty et al., 2021).

The results showed that there was no influence of the factors of age, family type, income, and education on family resilience. Based on the results of the research above, it was found that most families were aged 46–55 years; this indicates that the average age of the respondents is in the adult category. Adults generally have good mental readiness for thinking and making decisions (Riehm et al., 2021). According to previous research (Gayatri & Irawaty, 2021; Khesroh et al., 2022), a person's age does not affect family resilience because each individual can gradually adapt to their environment, including the problems they are facing from time to time (Suzuki et al., 2018). In this study, it was found that age and the respondent's last education do not guarantee the respondent's ability to maintain family resilience. Khesroh et al. (2022) said education did not affect family resilience. For individuals who have a history of higher education, it does not mean that there is a lot of knowledge that can be used to strengthen family resilience, and vice versa, a low level of education does not mean that family resilience is weak. Family resilience also cannot be influenced by the type of family, both large family and single parent families, this is because respondent's family type does not guarantee family resilience in the COVID-19 pandemic era. This statement is supported by research (Gardiner et al., 2019; Radetić-Paić & Černe, 2020), which states that compared to family type and family income, support from family members is more influential to strengthen family resilience.

In this study, the type of religion and belief that is adhered to has not been identified, so discussions related to the relationship with the religion that is adhered to cannot be explained. In addition, this research was conducted in rural areas where religious activities may be carried out more than in urban areas, so further research for different locations or urban areas can be carried out as a comparison.

However, this research is novel, so it can be used as a guideline, reference, and development for further research with a similar theme.

Conclusion

This study concludes that family resilience in utilizing socioeconomic resources is strongly influenced by religious coping factors. Strengthening the community with a religious approach is needed to support the family's line of defense against this pandemic condition. Religious coping serves as a backbone in various conditions, especially in an economic crisis; holding on to religious teachings that fortune has been arranged by God makes people believe more that God will not give difficulties that his people cannot go through. They believe that fortune also does not only turn into money but also other assistance from both extended family and neighbors who can help with existing problems.

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Conflict Of Interest

The authors declare no conflicts of interest in this study.

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Psychotherapies for posttraumatic stress disorder applied for people in Indonesia: A scoping review

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Abstract

Background: Posttraumatic stress disorder (PTSD) occurs as triggered or exposure to traumatic events. Psychotherapies have been proven to be effective and superior for people with PTSD. Several psychotherapies have been developed with different approaches. Yet the application of psychotherapy is rarely found and provided by professionals to those who need it in Indonesia.
Purpose: This study aimed to figure out the application of PTSD psychotherapies for people with PTSD based on studies conducted in Indonesia.
Methods: The review was reported following the PRISMA statement for scoping reviews. A systematic screening was performed in CINAHL, Cochrane library, Embase, Portal Garuda, PubMed, Scopus, as well as manual searches without language and date restrictions. The quality of the study was determined based on the risk of bias. Cochrane risk of bias 2.0 (RoB 2.0) and MINORS were used to evaluate the risk of bias of RCT and quasi-experimental studies, respectively.
Results: Five RCTs and four quasi-experimental studies published from 2008 to 2022 (n=465) were employed in this review. Three types of therapies were conducted for people with PTSD; five CBT studies, two EMDR studies, and two SHAT studies, performed in one day up to six weeks, one to 15 sessions, and 30 to 60 minutes for each session. All studies evaluated PTSD as the primary outcome, while the most measured secondary outcomes were depression and anxiety symptoms.
Conclusion: CBT was the most frequent therapy for Indonesian people with PTSD, followed by EMDR and SHAT. The application of therapies varied in frequency, duration, length of therapy, and component. Further research on the implementation of various types of psychotherapy for people with PTSD will be required.

Keywords: Indonesia; scoping review; psychotherapy; PTSD

Introduction

Psychological trauma arises from experiencing or witnessing traumatic events such as violence, abuse, assaults, natural disaster, war or political conflict, and accidents. Posttraumatic stress disorder (PTSD) occurs as triggered by or exposure to traumatic events (APA, 2013). According to the Diagnostic and Statistical Manual for Mental Disorder fifth edition (DSM-5), a person can be diagnosed for having PTSD if symptoms remain more than a month after exposure. Even though some traumatized people respond with resilience without intervention, some of them develop PTSD (Koenen et al., 2017; National Institute of Mental Health, 2022). Indonesia is prone to natural disasters (TheJakartaPost, 2019); therefore, people have a greater risk of developing PTSD.

PTSD showed the highest prevalence (34.4%) of psychological problems among natural disasters' survivors, followed by depression (25.0%) and prolonged grief disorder (23.3%) (Saeed & Gargano, 2022). Approximately 3.9 % of 51,797 people exposed to traumatic events developed PTSD, with a higher number of cases identified in upper-middle countries (Koenen et al., 2017). Numerous studies have been conducted to evaluate the prevalence of PTSD following disasters. The prevalence of PTSD among survivors was identified at 59.9% one year after an earthquake (Aurizki et al., 2019), 58.3% six months after an earthquake (Marthoenis et al., 2019), while 20.6% at five years after a tsunami (Irwanto et al., 2015). Besides, the overall incidence of PTSD in Sumatera and West Java populations was 20.9% (Downs et al., 2017).

The high prevalence of PTSD also comes along with consequences. Therefore, people with PTSD should be treated either using pharmacotherapies or non-pharmacotherapies. Untreated PTSD will lead to other mental health problems. People with untreated PTSD are more likely to conduct suicidal attempts, substance use, develop complex PTSD, have physical and mental health complications (Armenta et al., 2018; Flannery, 2001; Fox et al., 2021), and tend to show poor prognosis once they receive treatment (Priebe et al., 2009). As a consequence, prolonged morbidity, low quality of life, and higher cost of care are some problems that emerged (Priebe et al., 2009).

Psychotherapies have been proven to be effective and superior for people with PTSD (Coventry et al., 2020; Merz et al., 2019). Psychotherapies showed a high to moderate effect size in decreasing PTSD symptoms with low to high certainty (Yunitri et al., 2023). Based on the American Psychological Association (APA), several psychotherapies have been developed with different approaches. Cognitive behavior therapy (CBT), cognitive processing therapy (CPT), cognitive therapy (CT), and prolonged exposure (PE) are categorized as strongly recommended. On the second level, brief eclectic psychotherapy (BEP), eye movement desensitization and reprocessing (EMDR), and narrative exposure therapy (NET) are conditionally recommended. At the same time, seeking safety (SS) and relaxation (RLX) therapy is supported by limited evidence to be recommended as PTSD therapies (APA, 2017a). However, although psychotherapy was found as the most effective approach, most of the mentioned therapies for people with PTSD in APA are rarely found and provided by professionals to those who need it in Indonesia. To date, no review has been conducted to determine which psychotherapy was conducted for people with PTSD in Indonesia. Therefore, this study aimed to figure out the application of PTSD psychotherapies provided for people with PTSD in Indonesia.

Methods

Search strategy

This study was conducted following the guideline for conducting a scoping review developed by the Joanna Briggs Institute (JBI) (Peters et al., 2015), and the reporting followed the preferred reporting items for systematic review and meta-analysis (PRISMA) statement for scoping review (Tricco et al., 2018). The main idea of this scoping review was to determine the type of psychotherapy that had been applied and evaluated for people with PTSD in Indonesia. The terms were tailored to the specific databases using medical subject headings (MeSH) and emtree, combined with Boolean operators, to cover a broader yet relevant articles focus on "Indonesia," "psychotherapy," and "posttraumatic stress disorder" without language and date restriction. The search was conducted on August 2nd, 2022, in six databases, including CINAHL, Cochrane library, Embase, Portal Garuda, PubMed, and Scopus. Manual or hand search was also performed in Google Scholar and citations from potentially relevant studies.

Screening

A systematic screening was performed by two authors independently. Disagreements between authors were discussed with third parties until a consensus was achieved. Study was eligible to be included in this review if it met the following criteria:

Population

This study focused on evaluating the effectiveness of psychotherapy on people with PTSD without age, gender, or trauma background restrictions. PTSD diagnosis can be determined based on the clinician-rated or self-reported instrument.

Interventions and comparisons

Referring to the PTSD guideline issued by American Psychological Association (APA), cognitive behavior therapy (CBT), cognitive processing therapy (CPT), cognitive therapy (CT), prolonged exposure (PE), brief eclectic psychotherapy (BEP), eye movement desensitization and reprocessing (EMDR), narrative exposure therapy (NET) seeking safety (SS), and relaxation (RLX), have been mentioned as treatments for people with PTSD (APA, 2017a). However, in this study, we include all types of psychotherapies even though they were not listed in the APA guideline. The intervention could be compared to either active or passive comparisons.

Outcome

The primary outcome was PTSD symptoms at the treatment endpoint. The result from clinical rated is prioritized over self-reported if both data were provided in the article, while secondary outcomes depend on the availability of the included articles.

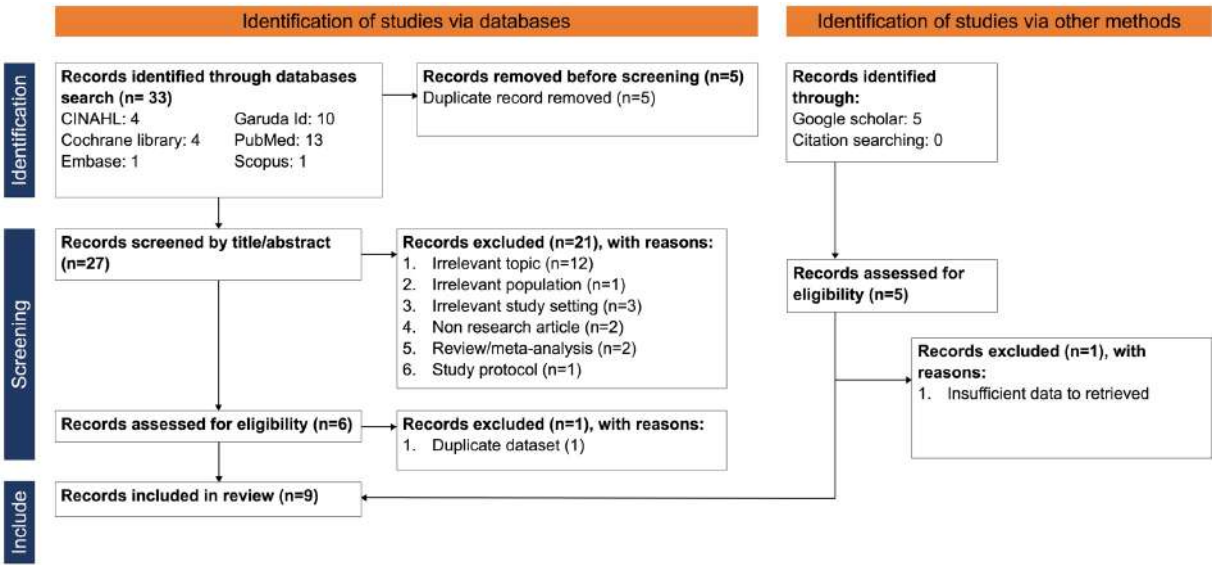

Figure 1. PRISMA Flow Chart Diagram

Study design

This study employed randomized controlled trials (RCTs) and quasi-experiment studies with a control group without language and date of publication restrictions. In case of duplicate publication with the same dataset, we include the one with a higher sample size or the latest publication date.

Data extraction

All studies included in this review were extracted by two authors based on study characteristics (study identity, journal name, study setting, study design, purpose, and quality), participant characteristics (population, diagnostic criteria, sample size, age, gender, and trauma background), intervention characteristics (psychotherapy name, frequency, duration, total time, content of the therapy, and therapist specification), and outcome characteristics (primary-secondary outcomes, instrument, and time measurement).

Quality assessment

The quality of the study was determined based on the risk of bias. Cochrane risk of bias 2.0 (RoB 2.0) and MINORS were used to evaluate the risk of bias of RCT and quasi-experimental studies, respectively. Cochrane RoB 2.0 assessed the risk of bias related to the randomization process, deviation from intended intervention, missing outcome data, measurement of the outcomes, and selection of the reported results. The bias is categorized into low, some concern, and high risk of bias (Higgins et al., 2022). Meanwhile, the methodological index for non-randomized studies (MINORS) was used to evaluate the risk of bias in quasi-experimental studies. The MINORS tool has been validated to assess the quality of comparative and non-comparative non-randomized surgical research. It has eight elements for non-comparative studies. The maximum score is 16 for non-comparative studies. The item score ranged from 0 to 2, and the final score will be categorized into three levels very low quality (0 to 4); low quality; (5 to 8), moderate quality (9 to 12); and high quality (13 to 16) (Slim et al., 2003).

Results

Search outcomes

Thirty-three studies were retrieved from CINAHL, Cochrane library, Embase, Portal Garuda, PubMed, and Scopus. Using EndNote, about five duplicate articles were removed. The remaining records were screened based on title and abstract, yielded six articles. Manual search through Google Scholar also found five articles that met the inclusion criteria. Two articles were excluded because of the same dataset and insufficient data, leaving nine records in this scoping review (Figure 1).

Studies characteristics

The nine studies were published from 2008 to 2022, with most RCT (57.1%), and conducted in other than Java Island (83.3%) of Indonesia. Among 465 participants, most of them were male (285; 61.3%), children (292; 62.8%), exposed to civil conflict or terrorist attacks (262, 56.3%), and diagnosed with PTSD using The University of California at Los Angeles Posttraumatic Stress Disorder Reaction Index (UCLA-PTSD RI), The Diagnostic and Statistical Manual of Mental Disorders IV text revision (DSM-IV-TR), Impact of Event Scale revised (IES-R), Structured Clinical Interview for DSM-5 (SCID-5), Child PTSD Symptom Scale (CPSS), Childhood Trauma Questionnaire (CTQ), and PTSD questionnaire by Weathers, Huska, and Keane (Table 1).

The contents of the interventions

We identify three types of therapies conducted for people with PTSD, including CBT (Dawson et al., 2017; Sarimin & Tololiu, 2017; Tol et al., 2008),

Table 1. Data Extraction of Included Studies of Psychotherapies for PTSD Applied in Indonesia

Study ID	Journal	Study purpose	Study setting & design	Population & Diagnostic criteria	Sample size, Age, & Gender	Trauma Background, n (%)	Outcomes (instrument)	Time measurement
Dawson et al., 2017	Australian and New Zealand Journal of Psychiatry	To evaluate the relative efficacies of Trauma-focused CBT and problem-solving therapy in treating PTSD in children affected by civil conflict in Aceh	Aceh RCT	Children UCLA PTSD RI	Sample size: 32 Age, M (SD): 10.5 (0.93) Female, n (%): 14 (43.75)	Civil conflict, 32 (100)	PTSD (Children report) PTSD (Caregiver report) Depression Anger	Baseline Posttreatment 3 months FU
Efendi et al., 2020	Working with Older People	To determine the effect of TF-CBT on the level of depression and the quality of life of the elderly living in post-disaster areas such as in the districts of North Lombok in Indo	Nusa tenggara barat RCT	Elderly CAPS-5	Sample size: 90 Age, M (SD): 71.28 (-) Female, n (%): 70 (77.8)	Disaster, 90 (100)	PTSD (CAPS-5) Depression (GDS-15) Quality oof life (WHO-QoL-BREF)	Baseline Posttreatment
Lesmana et al., 2011	Frontiers in American Journal of Clinical Psychosis	To assess the effectiveness of a SHAT for treatment of PTSD in children	Bali Quasi-experiment	Children DSM-IV-TR	Sample size: 48 Age, M (SD): 9.35 (1.33) Female, n (%): 23 (47.90)	Terrorist attacked, 48 (100)	PTSD (self-developed instrument)	Baseline 24 months FU
Lesmana et al., 2022	Egypt Journal Neural Psychiatry Neurosurgery	To assessed the behavioural effectiveness of SHAT on the modification of cortisol levels and PTSD symptom severity in adults with childhood trauma	Bali RCT	Adults PCL-C CTQ	Sample size: 29 Age, M (SD): 33.28 (5.66) Female, n (%): 16 (55.20)	NI	PTSD (PCL-C, Cortisol)	Baseline Posttreatment
Perangin angin et al., 2021	Jurnal Psikologi,	To investigate the effectiveness of CBT in reducing PTSD symptoms in survivors of Dating violence	Salatiga Quasi-experimen	Adults PCL-5	Sample size: 4 Age, M (SD): 23.25 (NI) Female, n (%): 4 (100)	Dating partners, 4 (100)	PTSD (PCL-5)	Baseline Posttreatment
Rahmania and Moordiningsih, 2012	Jurnal Intervensi Psikologi	To examine the therapeutic effect of differences in EMDR and stabilization technique to people with PTSD	NI Quasi-experiment	Adults IES-R	Sample size: 3 Age, M (SD): NI Female, n (%): NI	Accident, 3 (100)	PTSD (IES)	Baseline Posttreatment

Cont. Table 1. Data Extraction of Included Studies of Psychotherapies for PTSD Applied in Indonesia

Sarimin and Tololiu, 2017	International Journal of Research in Medical Science	To determine the difference score of PTSD symptom after receiving CBT PLUS in school-age children	Sulawesi Selatan Quasi-experiment	Children PTSD questionnaire by Weathers, Huska and Keane	Sample size: 30 Age, M (SD): NI Female, n (%): 18 (60%)	NI	PTSD (PTSD questionnaire by Weathers, Huska and Keane)	Baseline Posttreatment
Susanty et al., 2022	Frontiers in Psychology	To evaluate the effectiveness of EMDR of EMD in reducing PTSD symptom compared to retrieval-only control condition among Indonesian adults diagnosed with PTSD	Bandung, Cimahi, & Jakarta RCT	Adults SCID-5	Sample size: 47 Age, M (SD): 26.15 (6.81) Female, n (%): 42 (89.4)	Violence, 27 (57.4) Abuse, 5 (10.6) Other, 15 (31.9)	PTSD diagnosis (SCID-5) PTSD symptoms (PCL-5) Anxiety (HSCL-25) Depression (HSCL-25) Quality of life (WHO-QoL-BREF)	Baseline 1 week post-treatment 1 month FU 3 months FU
Tol et al., 2008	JAMA	To assess the efficacy of a CBT-school-based intervention designed for conflict-exposed children, implemented in a low-income setting	Poso RCT	Children CPSS	Sample size: 182 Age, M (SD): 10.08 (1.39) Female, n (%): 99 (54.4)	Conflict-exposed, 182 (100)	PTSD symptoms (CPSS) Anxiety (SCARED-5) Depression (DS-RS) Trauma idiom Function impairment Hope (CHS) Aggression (CAS-parent)	Baseline 1 week post-treatment 6 months FU

Abbreviation. Identity (ID); Sample size (n); Randomized controlled trial (RCT); Cognitive behavior therapy (CBT); Posttraumatic stress disorder (PTSD); The University of California at Los Angeles Posttraumatic Stress Disorder Reaction Index (UCLA-PTSD RI); Mean (M); standard deviation (SD); Follow up (FU); Trauma focused cognitive behavior tehrapy (TF-CBT); Clinician-administered PTSD scale based on DSM-5 (CAPS-5); Geriatric depression scale-15 (GDS-15); The world health organization quality of life brief version (WHOQoL-Bref); Spiritual-Hypnosis Assisted Therapy (SHAT); Diagnostic and statistical manual for mental disorder IV text revision (DSM-IV TR); PTSD checklist-civilian (PCL-C); Childhood trauma questionnaire (CTQ); No information (NI); PTSD checklist based on DSM-5 (PCL-5); Impact event scale revised (IES-R); Impact event scale (IES); Eye movement desensitization and reprocessing (EMDR); Eye movement desensitization (EMD); Structured clinical interview diagnosis based on DSM-5 (SCID-5); Hopkins symptom checklist 25 (HSCL-25); Children posttraumatic stress scale (CPSS); Screen for Child Anxiety Related Emotional Disorders (SCARED-5); Birleson depression self-rating scale (DS-RS); Children's hope scale (CHS); Children's aggression scale (CAS).

Table 2. Characteristics of Psychotherapies for PTSD Applied in Indonesia

Type of the intervention	Therapy sessions, duration, & frequency	Therapist	Content & format	Effectiveness	Study
CBT/TF-CBT	Length of therapy: 6-15 sessions Duration: 30-60 min Frequency: 1-3x/week	High school or higher level with CBT training for five to 14 weeks	Although the number of sessions of CBT in both studies were different, there are some common topics in such as psychoeducation, cognitive restructuring, trauma exposure either in vivo, prolonged, or narratively. The therapy was delivered in child-friendly format (games, video, school-based intervention) Dawson et al, 2017 Therapy was delivered in child-friendly activities, games, and videos. Session 1: Children, Psychoeducation about trauma and stress management Session 2: Children, Introduction to basic cognitive restructuring Session 3: Children & caregiver In vivo exposure Session 4: Children, In vivo exposure Session 5: Children, Modified prolonged exposure Session 6: Children, Modified prolonged exposure Sarimin & Tololiu, 2017 cognitive restructuring method (writing negative thinking and problem solving Tol et al, 2008 Session 1-3: Treatment information, safety-control, psychoeducation Session 4-6: Stabilization, awareness, self-esteem Session 7-9: Trauma narrative Session 10-12: Trauma narrative Session 13-15: Reconnecting child and group Efendi et al, 2020 NI Perangin angin et al, 2021 Phase 1: Psychoeducation Phase 2: Cognitive restructuring and behavior therapy Phase 3: Relaxation technique	CBT significantly decreased the symptom of PTSD, anger function impairment, hope, and quality of life overtime with low to moderate effect size at immediate posttreatment and short-term follow up	1,2, 5, 7, & 9

Cont. Table 2. Characteristics of Psychotherapies for PTSD Applied in Indonesia

EMDR	Length of therapy: 1-6 sessions Duration: 45-120 min Frequency: NI	Clinical psychologist with one-year training experience	Only Susanty et al, 2022 provide complete information due to content of EMDR therapy, which are: •Client history and treatment planning •Preparation •Assessment •Desensitization •Closure	EMDR showed significant effect to decrease PTSD symptom, anxiety, depression, and quality of life (p<.05) at immediate posttreatment and short-term follow ups Lower attrition rate (74.5%) for the EMDR group might affect the results	6, 8
SHAT	Length of therapy: 1 session Duration: 30 min Frequency: 1x/week	The researcher	Therapy was delivered as follow: •Meditation trance induction •Deep breath for 5 times •Guided suggestion and reframe the meaning of traumatic memories •Express the emotion and visualized the past •Express undesirable feeling with crying, shouting, or inhale/exhale •Guided to understand and accept the past trauma	SHAT showed larger PTSD symptoms reduction (p<.05) at immediate posttreatment and two years with effect size 0.52. In addition, more than half (77.1%) children received SHAT showed an improvement at two years follow up.	3, 4

Abbreviation. Posttraumatic stress disorder (PTSD); Cognitive behavior therapy (CBT); Trauma focused cognitive behavior tehrapy (TF-CBT); Eye movement desensitization and reprocessing (EMDR); No information (NI); Spiritual-Hypnosis Assisted Therapy (SHAT);

EMDR (Rahmania & Moordiningsih, 2012; Susanty et al., 2022), and Spiritual-hypnosis Assisted Therapy (SHAT) (Lesmana et al., 2009, 2022). Regarding the content, although only CBT contains psychoeducation, most therapies involve trauma recall and cognitive restructuring in treating PTSD. It brings back the traumatic experience through in vivo (Dawson et al., 2017; Lesmana et al., 2009, 2022), prolonged (Dawson et al., 2017), and narrative exposure (Tol et al., 2008) approaches.

The duration of intervention ranged from one day to six weeks. Generally, the intervention session varied from one (Lesmana et al., 2009, 2022; Rahmania & Moordiningsih, 2012), three (Sarimin & Tololiu, 2017), six (Downs et al., 2017; Perangin-Angin et al., 2021; Susanty et al., 2022), and12 (Efendi et al., 2020), to 15 (Tol et al., 2008) sessions. The length of the session ranged from 30 to 60 minutes. The frequencies were weekly (Dawson et al., 2017) and semiweekly (Tol et al., 2008). Most of the therapy was delivered by trained therapists with a wide range of qualifications, while one was provided (Lesmana et al., 2009) or might be provided (Lesmana et al., 2022; Sarimin & Tololiu, 2017) by the researcher itself and by non-professional trained healthcare therapists (Dawson et al., 2017; Tol et al., 2008).

Outcomes, tools, and measurement times

Participants were diagnosed with PTSD using various instruments, including The University of California at Los Angeles Posttraumatic Stress Disorder Reaction Index (UCLA-PTSD RI), The Diagnostic and Statistical Manual of Mental Disorders IV text revision (DSM-IV-TR), Impact of Event Scale revised (IES-R), Structured Clinical Interview for DSM-5 (SCID-5), Child PTSD Symptom Scale (CPSS), Childhood Trauma Questionnaire (CTQ), PTSD Checklist for DSM-5 (PCL-5), and Clinician-Administered PTSD Scale for DSM-5 (CAPS-5). All nine included studies measured PTSD symptoms as the primary outcome. In addition, PTSD symptoms were also assessed from the parents' perspective (Dawson et al., 2017). Depression (Dawson et al., 2017; Susanty et al., 2022; Tol et al., 2008) and anxiety symptoms (Susanty et al., 2022; Tol et al., 2008) were the most common secondary outcomes

Table 3. Quality Assessment of Psychotherapies for PTSD Applied in Indonesia

Study ID	Domain ROB)					Overall bias
	1	2	3	4	5	
Dawson et al, 2021	S	L	L	L	L	Some concern
Effendi et al, 2020	L	S	L	L	L	Some concern
Lesmana et al, 2020	L	L	L	L	L	Low
Susanty et al, 2022	L	L	L	L	L	Low
Tol et al, 2008	L	L	L	L	L	Low

Study ID	Items MINORS								Overall score	Quality
	1	2	3	4	5	6	7	8		
Lesmana et al, 2009	2	2	2	2	1	2	2	2	15	High
Peraning et al, 2021	2	2	2	2	1	2	2	1	14	High
Rahmania, et al, 2012	2	2	2	2	0	2	1	2	13	High
Sarimin et al, 2017	2	2	2	1	0	2	1	2	12	Moderate

Abbreviation. Identity (ID); Cochrane risk of bias 2 (ROB 2); Methodological index for non-randomized study (MINORS); Low risk of bias (L); Some concern (S); High risk of bias (H).
Note. The RCTs studies were assessed using Cochrane RoB 2 while quasi-experimental studies were use MINORS. Cochrane RoB 2 devided the study into low risk of bias, some concern, and high risk of bias according to five domains. In MINORS, eight items were used to evaluate the quality of non-randomized study. The items are scored 0 if not reported, 1 if reported but inadequate, 2 if reported as well as adequate. The total score was categorized into very low quality (0-4), low quality (5-8), moderate quality (9-12), and high quality (13-16).

measured.

Regarding time measurement, almost all studies assessed the outcomes immediately one-week post-treatment (Dawson et al., 2017; Rahmania & Moordiningsih, 2012; Sarimin & Tololiu, 2017; Susanty et al., 2022; Tol et al., 2008). The short-term and long-term longitudinal effect was measured at one month (Susanty et al., 2022), three months (Dawson et al., 2017; Susanty et al., 2022), six months (Tol et al., 2008), and 24 months (Lesmana et al., 2009) after treatment.

Discussion

To our knowledge, this is the first study that has explored the adoption or application of various psychotherapies for Indonesian people with PTSD. Considering that Indonesian people are at a higher risk of developing PTSD because of being exposed to many disasters, the number of studies included in this review is relatively low.

Among nine suggested psychotherapies for PTSD according to the APA guideline, only CBT and EMDR were applied, evaluated, and reported in peer review published journals. Although there was an improvement in the Indonesian international publication rate within five years, the lack of studies conducted might be related to low number of experimental study among Indonesian scientists. Considering the high number of people affected by COVID-19 as the latest disaster hit, the authors found it interesting to determine an increasing trend due to the application of PTSD psychotherapies in Indonesia within five to ten years following. Therefore, a high number of trained therapists were needed to deliver the therapy to those who needed it.

Overall, all included studies showed a statistically significant effect of psychotherapy in decreasing PTSD symptoms with low to moderate effect size at immediate post-treatment, short-term, and long-term follow-up measurements. Psychotherapies also significantly impacted anger, hope, anxiety, depression, quality of life, trauma idioms, aggressive behavior, and functional impairment.

Cognitive Behavior Therapy

This study found CBT as the most evaluated psychotherapy for people with PTSD in Indonesia. CBT has been shown as an effective psychotherapy with a moderate effect size in decreasing PTSD symptoms (Kliem & Kröger, 2013; Sijbrandij et al., 2016). Compared to the original version, some discrepancies were found in the total sessions given, duration, content, and frequency among the five studies included. According to APA, CBT is typically delivered in 12 to 20 sessions in individual or group format (APA, 2017b; Fenn & Byrne, 2013). Among three studies included that determine the effectiveness of CBT for PTSD, one study conducted CBT in 15 sessions (Tol et al., 2008), one study in 12 sessions (Efendi et al., 2020), two studies in six sessions (Dawson et al., 2017; Perangin-Angin et al., 2021), and one study in three sessions (Sarimin & Tololiu, 2017).

Many previously published studies also

found a varied number of sessions, influenced by several considerations such as study participant's characteristics. Although the number of therapy sessions was shortened, the core component of therapy should still be applied. The core component of trauma-focused CBT (TF-CBT) is cognitive restructuring and exposure (Fenn & Byrne, 2013). This study found not all studies provide information due to the core component of psychotherapy delivered to the participants (Efendi et al., 2020; Sarimin & Tololiu, 2017).

The effect of CBT on PTSD symptoms was evaluated at immediate post-treatment, as well as at three (Downs et al., 2017) and six months (Tol et al., 2008) follow-ups. Limited studies evaluated the longitudinal effect of CBT. Both were RCTs and included children as their participants. In addition to the primary outcome, depression was identified as the most frequently measured secondary outcome (Dawson et al., 2017; Efendi et al., 2020; Tol et al., 2008), as major depressive disorder (MDD) is comorbid with PTSD (Flory & Yehuda, 2015).

Eye Movement Desensitization and Reprocessing

This study also found EMDR therapy evaluated was different from the original version. EMDR was originally developed by Shapiro and consisted of eight sessions (Shapiro, 1989). Yet, in the studies included, one study conducted four to six sessions (Susanty et al., 2022) and one session of EMDR (Rahmania & Moordiningsih, 2012). The core component of EMDR is memory processing, bilateral stimulation, and the therapeutic relationship (Hase, 2021). The study by Rahmania and Moordiningsih (2012) delivered a one-session EMDR on three participants. Limited information can be retrieved from this study, such as study setting, therapy content, therapist qualifications, and participant characteristics.

Compared to other types of psychotherapy, EMDR can be considered as a newly developed treatment for people with PTSD. However, EMDR showed an effective treatment for PTSD symptoms with a high effect size either in adults (Mavranezouli et al., 2020a) or younger populations (Mavranezouli et al., 2020b).

Spiritual-Hypnosis Assisted Therapy

This study found SHAT as a new therapy developed by the author. As a newly developed therapy, detailed information about the core component of the therapy was provided. Limited studies evaluated the effectiveness of SHAT on people with PTSD. SHAT was delivered in one shoot in both studies (Lesmana et al., 2009, 2022). In the first study, the effect of SHAT on PTSD might be biased because it was measured two years after the treatment was delivered (Lesmana et al., 2009). However, a more advanced study design and procedure was adopted in the second study. The effectiveness of SHAT was evaluated through an RCT study, compared to a control group, and outcomes were measured at baseline and immediate post-treatment. Although not all outcomes showed significant results statistically, two outcomes were measured in this study; PTSD symptoms and biomarker (cortisol) (Lesmana et al., 2022).

Despite the strong evidence found related to the effectiveness of psychotherapies for PTSD people in Indonesia, several limitations found need to be considered when interpreting the results. First, as mentioned previously, a limited number of studies were included in this scoping review. This might be related to a lack of interest in conducting and publishing experimental studies related to PTSD in Indonesia. Second, weak research methods were found in some studies, primarily related to the sample size, research design, therapist qualification, as well as the blinding method. As a consequence, high risk of bias may affect the study's quality.

Conclusions

Limited studies have been published about PTSD psychotherapy performance in Indonesia. CBT was the most frequent therapy delivered for Indonesian people with PTSD followed by EMDR and SHAT. The application of therapies varied in frequency, duration, length of therapy, and component. Therefore, there is a need to provide training about PTSD psychotherapy, but not limited to CBT, EMDR, and SHAT, for health professionals as the first-line health service. The local government should support international publications for the application of PTSD psychotherapy. Further research on implementing various types of psychotherapy for people with PTSD will be required.

Implications

This scoping review assists clinicians and the government in determining the implementation of psychotherapies for people with PTSD in Indonesia. Even though psychotherapies are superior to other types of interventions, their utilization is lacking. In addition, this study also plays an essential role for scientists as the fundamental data for further research topics.

Declaration of conflict of interest

The authors declare that there is no conflict of interest.

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Data availability

Data sharing is not applicable to this article as no datasets were generated or analysed during the current study.

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Prevention of cardiovascular disease in the community through walking intervention: A scoping review

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Abstract

Background: Cardiovascular disease is the number one killer in the world. The SDGs target reducing mortality through cost-effective prevention efforts. Physical activity, including walking, has been proven to prevent cardiovascular disease. Walking is an activity that is cheap, easy, simple, and does not need tools and skills, so it can be done in general by the community. However, the modern world makes people's walking activities low. There is a need to find evidence of walking interventions that can increase walking and prevent cardiovascular disease.
Purpose: This scoping review aims to identify literature focusing on walking interventions that increase footsteps and reduce disease risk to prevent cardiovascular disease.
Methods: Following the guidelines for the JBI scoping review methodology. Articles conducted searches on the Ebscho CINAHL, Academic, PubMed, and ProQuest databases from 2013 to 2021. The collected data were extracted in tabular and narrative form.
Results: Thirteen articles met the criteria involving 2,910 people from eight countries. Eleven studies used a randomized controlled trial, and two used a quasi-experimental design.
Conclusions: Walking interventions that support increased footsteps include: distance, duration per week (< 150 minutes or > 150 minutes), supervision, activities accompanied by socio-cultural activities, counselling, and motivation, in addition to the use of tools such as pedometers, accelerators, and smartwatch is used as a footstep monitor. Intervention in walking is beneficial in reducing cardiovascular diseases risk indicators such as blood pressure, BMI, blood glucose, cholesterol, and triglycerides.

Keywords: Cardiovascular disease; community; prevention; walking intervention

Introduction

The World Health Organization (WHO) states that cardiovascular disease is the number one killer in the world (WHO, 2017). The 2030 SDGs target a 30% reduction in deaths from non-communicable diseases through cost-effective interventions (IHME, 2020). Physical activity is a primary and secondary prevention factor for cardiovascular disease in the community (Lavie, Ozemek, & Kachur, 2019). Preventive efforts are more cost and time effective than curative efforts and significantly impact the community (PERKI, 2019). However, the modern world makes people's physical activity low (WHO, 2018).

Technological progress is one of the reasons why people do less physical activity, where more time is spent sitting in front of the television and using smartphones (Benjamin et al., 2019). Four out of five adolescents aged 11-17 years and one out of five adults do not do enough physical activity (WHO,

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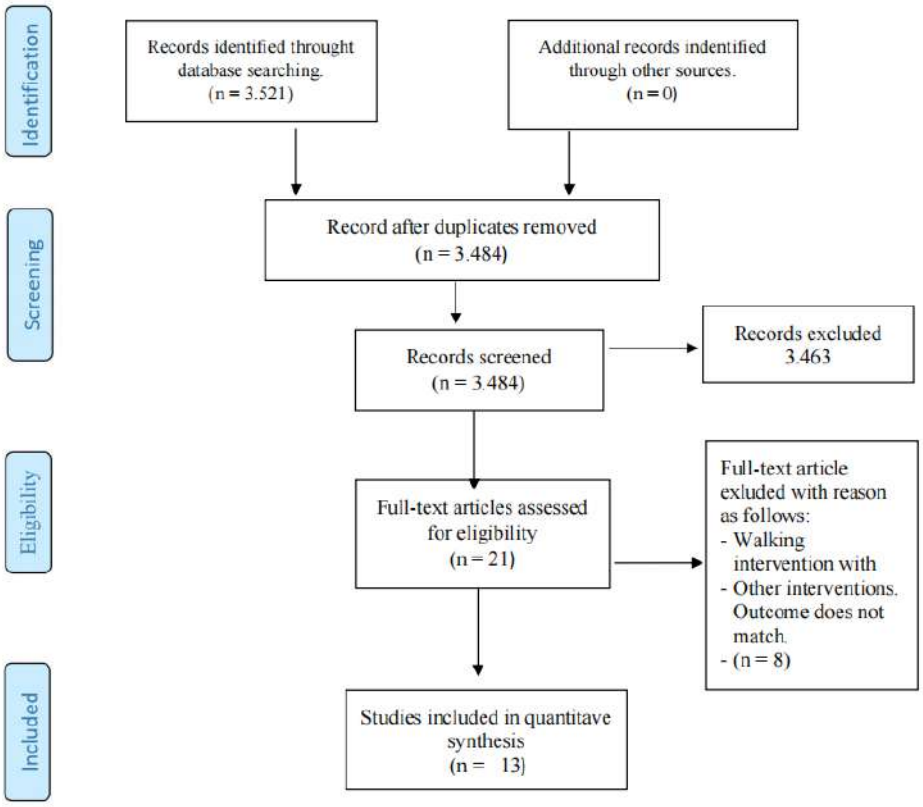

Figure 1. Data processing flowchart

2018). Some evidence shows a relationship between physical inactivity and the risk of cardiovascular disease. Physical activity reduces the risk of disease and death from cardiovascular disorders (Bell et al., 2013; Chomistek et al., 2018; Lear et al., 2017; Mengyu et al., 2019).

Walking is an activity that everyone can do because it is easy, simple, and cheap, with no need for tools, special skills, and special facilities (JN, 1997). Walking also improves health (Lee & Buchner, 2008). Light-intensity walking is leisurely, and moderate-intensity walking is brisk walking (Lanier, Bury, & Richardson, 2016).

The American Heart Association (AHA, 2017) says brisk walking can reduce the risk of cardiovascular disease, maintain blood pressure, total cholesterol, and blood sugar, increase stamina, sleep quality, memory, and bone strength, and maintain body weight. Walking also lowers blood pressure, BMI, and HDL cholesterol (Chen, Ismail, & Al-Safi, 2016; Soroush et al., 2013). Research regarding brisk walking for one hour daily finds it effectively reduces the risk of heart disease. In addition, it also increases life expectancy, which is higher, namely 85.2 to 86.8 years in men and 86.7 to 87.8 years in women (Zaccardi, Davies, Khunti, & Yates, 2019).

Group walking also improves social relationships and mental health and increases motivation to stay active (Cooper & Hancock, 2012; Lee et al., 2017; Yaacob & Azidah, 2018). Walking in green open spaces also elevates mood and reduces depression, feelings of anger, and tension (Barton, Hine, & Pretty, 2009). Group walking activities increase socialization with the environment, encouraging someone to be more active (JN, 1997). Partner support also plays a role in increasing walking practice (Minneboo et al., 2017). The results of the research above provide information that walking accompanied by both physical and psychological support can make people more active in walking activities to increase footfall in society.

It is known that the footsteps of Indonesians rank last out of 46 countries, with an average of only 3,513 per day. The data are below Singaporeans' daily steps, reaching 5,674 per day (Kemenkes RI, 2018). The recommended moderate-intensity walking is 30 minutes daily or about 150 minutes weekly (WHO, 2010). It is necessary to look for evidence of walking interventions that increase walking and reduce disease risk to prevent cardiovascular disease.

Methods

Scoping review follows the JBI methodology, using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) checklist as a writing guide. A literature search was conducted on PubMed, CINAHL, Academic, and ProQuest.

Table 1. Data Extraction

Author, Year	Country	Design	Title	Population	Prosedur Intervensi	Outcome	Result
(Jong-Hwan et al., 2014)	Japan	Quasi eks-perimen	Low-Volume Walking Program Improves Cardiovascular-Related Health in Older Adults	28 people aged > 60 years.	-Distance ≤ 3.5 -Duration ≤ 150 minutes per week -Supervised by an experienced assistant -Activities are done alone Using the accelerometer.	-Blood pressure: Significantly lower (P<0.001) -BMI Significantly decreased (P<0.05) -Blood glucose: Lower (P:0.46) -Cholesterol did not drop significantly Triglycerides did not drop significantly.	-Compliance rate 92.3±1.8%.
(Schulz et al., 2015)	USA	RCT:	Effectiveness of a walking group intervention to promote physical activity and cardiovascular health in predominantly non-Hispanic Black and Hispanic urban neighborhoods: Findings from the Walk Your Heart to Health Intervention	695 people with an average age of 46.6 ± 13.5 years.	-Duration ≥ 150 minutes per week -Supervision by health workers -Accompanied by a partnership approach and counseling Group activities.	-Blood pressure: Significantly lower (P<0.001) -BMI Significantly decreased (P<0.05) -Blood glucose: Significantly decreased (P< 0.05) Cholesterol: Significantly decreased (P<0.05).	-Daily steps increased by 2,110 per day. .
(Ohta et al., 2015)	Japan	RCT: Crossover design	Effects of daily walking on office, home, and 24-h blood pressure in hypertensive patients	65 people with an average age of 60.2 ± 9.4 years.	-Duration ≥ 150 minutes per week -10,000 daily step goal Activities are done alone	-Blood pressure: Significantly decreased (P<0.05) -BMI Significantly decreased (P<0.05) -Blood Glucose: Significantly Decreased (P<0.001) -Cholesterol did not drop significantly Triglycerides decreased significantly (P<0.05).	Daily steps increased by 10049 +3403 per day.

Cont. Table 1. Data Extraction

(Lee et al., 2017)	South Korea	Quasi eks-perimen	Effects of culturally adaptive walking intervention on cardiovascular disease risks for middle-aged Korean-Chinese female migrant workers	132 with an average age of 56.40 ± 5.09 years.	-Duration ≥ 150 minutes per week -Supervision by health workers (Nurses) -Activities are carried out in groups Using a pedometer.	-Blood pressure: Significantly lower (P<0.001) -BMI Significantly decreased (P<0.001) -Blood glucose Significantly decreased (P<0.001).	-Daily steps increased by 10,000 per day.
(Arija et al., 2017)	Spain	RCT	Effectiveness of a physical activity program on cardiovascular disease risk in adult primary health-care users: the “Pas-a-Pas” community intervention trial	364 people with an average age of 65.19 years.	-Distance >3.51 km -Duration ≤ 150 minutes weekly -Supervision by a health professional -Accompanied by socio-cultural activities Done in groups.	-Blood pressure: Significantly decreased (P<0.001) -Blood glucose: Significantly decreased (P<0.001) -Cholesterol Significantly decreased (P<0.001).	-Compliance rate 72.8 % (P<0.001).
(Yu et al., 2018)	China	RCT	A novel prescription pedometer-assisted walking intervention and weight management for Chinese occupational population	802 people with an average age of men and women; 27.3 ± 4.2 and 41.1 ± 9.5 years.	-Done independently Using a pedometer.	-Blood pressure: Significantly decreased (p<0.05) -BMI Significantly decreased (P<0.001) -Blood glucose significantly decreased (p<0.05) -Cholesterol Significantly decreased (P<0.05) Triglycerides don’t go down.	Compliance rate of 89.5 %.
(He et al., 2018)	China	RCT	Effects of 12-week brisk walking training on exercise blood pressure in elderly patients with essential hypertension: a pilot study	69 people with an age range of 55-60 years.	-Group activity in the community garden -Society as supervisor Using the Accelerometer tool.	-Blood pressure: Significantly decreased (P< 0.05) BMI Significantly decreased (P < 0.05).	-Compliance rate above 91 percent Daily steps increased by 10.835 + 1235 (P<0.001).

Cont. Table 1. Data Extraction

(Arija et al., 2018)	Spain	RCT	Physical activity, cardiovascular health, quality of life and blood pressure control in hypertensive subjects: randomized clinical trial	207 people with an average age of 68.2 years.	-Distance >3.51 km -Weekly duration ≤ 150 minutes -Supervised by nurses and PA specialists -Accompanied by socio-cultural activities Group activity.	-Blood pressure: Significantly decreased (P< 0.05) BMI Significantly decreased (P < 0.05).	Increase physical exercise.
(Brustio et al., 2018)	Italy	RCT	Participation in a school-based walking intervention changes the motivation to undertake physical activity in middle-school students	276 people with an average age of 13 ± 1 year.	-Distance ≤ 3.5 km -Duration ≤ 150 minutes per week -Teacher supervision Group activity.	There was no change in BMI.	Increase student motivation in doing physical exercise during school breaks.
(Chiang, Chen, Hsu, Lin, & Wu, 2019)	China	RCT	Is the goal of 12,000 steps per day sufficient for improving body composition and metabolic syndrome? The necessity of combining exercise intensity: a randomized controlled trial	32 people with a mean age of 19.72 ± 0.80 years.	-Weekly duration ≥ 150 minutes -Supervision by a professional instructor Using Smartwatch.	-Blood pressure: Not significant (P>0.05). -BMI Significantly decreased (P>0.05) -Blood glucose Significantly decreased (P<0.05) Triglycerides Significantly decreased (P<0.05)	-Increased 12,288 steps per day Changes in some body composition.
(Lee, Hung, Lin, & Chiang, 2019)	Taiwan	RCT	Controlled randomized trial of walking exercise with positive education on cardiovascular fitness and happiness in retired older adults	150 people with an average age of 61 years.	-Weekly duration ≥ 150 minutes -Supervision by a professional instructor Using a pedometer	-BMI Significantly decreased (P<0.01).	-96.70 percent compliance rate (P<0.01).
(Rodriguez-Hernandez & Wadsworth, 2019)	Spain	RCT	The effect of 2 walking programs on aerobic fitness, body composition, and physical activity in sedentary office employees	68 people with an average age of 46±9 and 48±9 years.	-Weekly duration ≥ 150 minutes -Done independently Using the accelerometer.	-BMI Significantly decreased (P<0.05)	-Compliance rate 80.95%.
(Sousa Jr et al., 2020)	Brazil	RCT	Physical Activity Counseling for Adults with Hypertension: A Randomized Controlled Pilot Trial	22 people with a mean age of 48.8 ± 7.3 years.	-Weekly duration ≤ 150 minutes -Done independently -Accompanied by counseling Using a pedometer.	-Blood pressure: Not significantly decreased.	Daily steps increased by 800 steps.

Inclusion Criteria

Participant
This scoping review aims to identify all studies focusing on walking interventions in the community (age 12 years to 75 years) that increase walking and reduce disease risk to prevent cardiovascular disease.

Concept
This review focuses on studies with the primary interventions being walking and brisk walking in the community.

Context
People aged over 12 years to 75 years who participated in the walking intervention resulted in a decrease in cardiovascular disease risk indicators such as blood pressure, BMI, total cholesterol (HDL and LDL), blood glucose, and triglycerides.

Type of Source
This scoping review uses a quantitative study with experimental, quasi-experimental, and RCT interventions.

Study selection
Figure 1.

Results

Search results from the database obtained 3,521 articles. Thirty-seven duplicate articles were discarded. The selection was conducted until a remaining 13 articles were included in the scoping review. Articles were published from 2014 to 2020 in English and full text. Eleven of the thirteen articles were obtained using randomized research methods and controlled trials, and two used quasi-experimental design methods.

The number of participants involved was 2,910 people, with the smallest number of participants being 22 people and the highest being 802. The number of female participants was generally higher than that of male participants, although one article did not explain the number of participants by gender. The youngest participant's average age was 13 years, and the oldest's average was 68.2 years.

From the results, two studies used distances below 3.5 km, and two used distances above 3.5 km. Five studies were conducted with durations under 150 minutes per week, and eight were conducted with durations above 150 minutes per week. Walking activities were carried out under supervision or monitoring by various professions, including five studies conducted by physical activity professionals, four studies supervised by health workers, one by teachers, and one by the community, while three studies were conducted independently. Three studies were conducted accompanied by sociocultural activities and partnerships. Three studies accompanied counseling and motivation. Seven studies were conducted in groups, and five studies were conducted individually. Nine of the thirteen studies used activity monitoring devices, both pedometers, accelerometers, and smartwatches.

Almost all studies that measure blood pressure show significant changes in blood pressure. Changes in BMI also got significant results even though some did not. Changes in blood glucose also got more significant results. Total cholesterol only fell in three studies. Decreases in triglycerides were found in two of the four studies that measured it.

Discussion

Walking intervention as cardiovascular prevention
Intervention walking is beneficial in reducing cardiovascular disease risk indicators such as blood pressure, BMI, blood glucose, cholesterol (HDL and LDL), and triglycerides. Prevention of cardiovascular disease is focused more on factors that can be changed, namely through sufficient physical activity. The target in the scoping review is a healthy community and people already at risk of experiencing cardiovascular disease. Walking is beneficial for cardiorespiratory fitness, preventing community cardiovascular disease. Besides that, walking also overcomes high blood pressure, increases good cholesterol levels, and controls blood sugar (Bubnis, 2019). It can be concluded that walking is suitable for people who are healthy and who have shown a risk of cardiovascular disease.

Many walk because it is easy, safe, does not require tools, and has a low risk (JN, 1997). In addition, walking is also the right choice for people who do not move much (Ogilvie et al., 2007) because the targets involved in this intervention are groups of people who do not move much or do not actively engage in physical activity.

Getting more than 10,000 daily steps is difficult for people with low activity. Evidence shows that walking an additional 1,000 steps per day can also reduce the cause of death from cardiovascular disease in adults by 5-21% (Hall et al., 2020). It is known that the number of daily steps the Indonesian people is only 3,513 per day (Kemenkes RI, 2018). This shows that the walking activity of Indonesian people is still low.

The problem of low activity is also a problem in some adult populations in East Asia, where some of these populations need to meet the recommended activity recommendations (Wai et al., 2008). This behavior is coupled with the ease of access to transportation in today's modern world, which makes people increasingly lazy to do physical activities, besides that walking facilities in the environment also do not support people to be more active on foot (Kemenkes RI, 2018). So a promotion strategy is needed to increase people's daily steps.

The benefit of walking in preventing cardiovascular disease is improving body

composition, which indicates cardiovascular disease risks such as blood pressure, BMI, blood sugar, triglycerides, and cholesterol. The recommended moderate-intensity walking is 30 minutes daily or around 150 minutes weekly (AHA, 2017). Almost all studies that measure blood pressure get significant results, both at interventions ≤ 150 minutes or those that are ≥ 150 minutes per week. Only one study on each intervention showed no significant results. This is due to the few daily steps achieved, namely 6428 steps per day. Health-promoting benefits are obtained by lowering and controlling blood pressure according to and below recommendations. A blood pressure lowering effect was also found in a meta-analysis by Murtagh et al. (2015), where systolic blood pressure fell to -3.58 mmHg, and diastolic blood pressure fell to -1.54 mmHg.

Walking effectively promotes physical activity in society (Kassavou, Turner, & French, 2013). Walking is also effective at increasing footfall and has many health benefits. Thus it becomes a good exercise as an adjunct to public health care and a proactive health promotion activity (Hanson & Jones, 2015).

Walking Intervention Steps and Recommendation

Intervention walking procedures that support increasing footsteps include distance. Distance dictates walking exercises that can increase stride. Ten thousand steps per day equal a distance of 6-8 km. One study in this scoping review performed low-volume activities with 2.5-3.5 km distances per session but found results in lower body composition. This shows that walking at a minimum distance is beneficial for maintaining a healthy body. In addition, walking time per week also determines the benefits of walking on cardiovascular health.

The American Heart Association recommends moderate-intensity walking for 30 minutes daily or about 150 minutes weekly (AHA, 2017). Walking as recommended has been shown to get better results on a decrease in body composition. However, this Scoping review also shows significant results in interventions under the recommendation of ≤ 150 minutes per week. This suggests that low-volume exercise under the recommendations can also reduce the risk of cardiovascular disease. Low-volume walking exercise can be a promotion for adults and the elderly because of the ease of doing the exercise (Jong-Hwan et al., 2014). In addition, Wen et al. (2011) also found that activity of 92 minutes per week or an average of 15 minutes per day reduced disease rates and increased life expectancy. A brisk 10-minute walk per day also has the potential to improve health (Brannan, Varney, Timpson, Murphy, & Foster, 2017). It can be concluded that low-volume walking per day below 150 minutes a weeks can be done more quickly for older people, so it can be a promotion to reach older people to stay active.

Another determining factor in increasing the daily pace of the community is partnership and involvement in targeted sociocultural activities. The partnership is a process of improving the relationship between the mind and the community to facilitate the goals of health interventions. To maintain partnerships, reflection, and collaboration are needed (Melo & Alves, 2019), so that interventions involving partnerships can be more accepted by the community, which can increase people's footsteps. Besides that, sociocultural activities included in walking training activities can improve mood and mental health thoughts (Arija et al., 2017). Motivation and counseling are also decisive in increasing daily steps. People must be motivated to carry out activities regularly to get the most out of physical exercise (Ferguson, 2014).

Positive education on walking intervention is an approach that increases positive emotions, strength, self-concept, and motivation (Levy, 2018). In their research, Lee et al. (2019) combined positional exercises to increase the compliance of older people to carry out walking activities. The result is that compliance reached 96.7%. In addition, promoting physical activity must be accompanied by motivation and social support, a pleasant environment, and an atmosphere (Zubala et al., 2017). Supervision also determines success in increasing daily steps; supervision by Physical Activity professionals, health workers, teachers, and the community increases compliance with walking exercises. This aligns with the findings by Picorelli et al. (2014) who said that supervision by health professionals increases adherence to physical activity. Walking intervention by public health nurses in the elderly group has been found to have increased people's footsteps (Harris et al., 2015).

Conclusion

The target of walking intervention is people with a low level of physical activity. The target is also carried out on people who are healthy and who already have a risk of cardiovascular disease. Walking interventions that support increased footsteps include: distance, duration per week (< 150 minutes or > 150 minutes), supervision, activities accompanied by socio-cultural activities, counseling, and motivation, carried out in groups or individually in addition to the use of tools such as pedometers, accelerometers, and smartwatches are used as footstep monitors. The benefits of walking intervention in preventing cardiovascular disease include blood pressure, BMI, blood glucose, triglycerides, and cholesterol. Changes in blood pressure and BMI are risk indicators that benefit the most from walking interventions. Meanwhile, cholesterol and triglycerides were the most minor measured indicators and experienced changes in the benefits of the walking intervention.

Conflict of Interest

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none

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A successful separation of omphalopagus twins during COVID-19 pandemic: A case report

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Abstract

Background: Omphalopagus is a rare condition involving digestive system and abdominal wall fusion. This study reports an omphalopagus case during the early phase of the coronavirus disease 2019 (COVID-19) pandemic in Indonesia.
Case: Male conjoined twins, aged 14 months, were diagnosed with omphalopagus and several organ failures. We performed separation surgery of the omphalopagus with primary closure and post-surgical care for fifteen days. The early surgery was preferable in this case due to life-threatening issues of COVID-19, despite omphalopagus separation may cause post-surgical complications. Furthermore, the emerging pandemic conditions also required a more stringent procedure to avoid the risk of viral spread.
Conclusion: We conclude that, in the lack of evidence-based instruction for hospital care during the early phase of COVID-19 in Indonesia, life-saving surgical considerations from death due to complications of COVID-19 infection and acute respiratory distress syndrome must be performed and prioritized. However, potential omphalopagus complications must be evaluated.

Keywords: congenital abnormalities; conjoined twins; COVID-19; omphalopagus

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Introduction

Conjoined twins are a rare embryologic developmental disorder of uncertain etiology. Its prevalence, although variable, has been estimated to be 1 in 50,000 to 1 in 100,000 births (Mutchinick et al., 2011). However, the latest data showed that conjoined twins occur in one per 250,000 births (Zainuddin et al., 2021). The separation of conjoined twins presents a unique challenge due to its rarity (Poudel et al., 2022). Although omphalopagus twins have the best survival chances, adequate pre-operative planning is required (Van Klei et al., 2012). In addition, radiological investigations must evaluate any presence of shared organs, anomalies, and cross circulation (Sultan & Tawfeek, 2016).

Lung infection and bacterial septicemia due to Methicillin-Resistant Staphylococcus Aureus (MRSA) contribute to higher mortality, especially following the thoracopagus and omphalopagus separation (Sultan & Tawfeek, 2016). Several COVID-19 patients are high-risk to develop pulmonary super-infection or bacterial co-infection causing unfavorable outcome (Bassetti et al., 2022). Furthermore, surgical pediatric nursing roles become challenging in socio-psychological emotional management

(Yosep et al., 2022). Hence, this study reports omphalopagus twins of 14-month-old males with high risk pulmonary infection co-infection during the early COVID-19 global pandemic.

Case Presentation

A Male conjoined twins named Ba and Be, aged 14 months, were delivered through the C-section procedures from G3P2A0 at 36 weeks of pregnancy. They were fully vaccinated based on Indonesian Pediatric Society recommendation (Tan et al., 2020). Their bodies were fused from epigastrium to umbilicus with one umbilical cord. Ba's distal extremities did not appear blue with 98% pulse oximetry, while Be's distal extremities were cyanotic with 83% pulse oximetry (Figure 1). Hematological work-up showed hemoglobin levels of 13.9 g% and 9.1 g% for baby Ba and Be, respectively, with normal biochemistry parameters. These results were related to the history of Be's Pentalogy of Fallot (POF).

The physical examination showed a compos mentis consciousness, normal vital signs, ±9.1 kg bodyweight for each baby, 82 cm and 80 cm height for baby Ba and Be, respectively. Ba showed a normal-regular first and second heart sound, while Be showed grade V of continuous murmurs with maximum punctum in intercostal space III-IV of left midclavicular line, without gallop rhythm. The initial babygram found intestinal system interconnection in the anterior abdominal. This finding confirmed the omphalopagus diagnosis.

Be's echocardiography showed POF. The abdominal contrast CT-scan showed a fused liver with Be's vascularization directly inside Ba's liver. Be's intestine was partially merged with Ba's vascularization with splenomegaly (Figure 2). The contrast-filled oesophagography showed that Be's jejunum had entered Ba's abdominal space through an abdominal defect. The percutaneous transhepatic biliary drainage showed proximal common bile duct obstruction in Be. In addition, the magnetic resonance cholangiopancreatography of the biliary systems showed that the intrahepatic bile duct of Be had entered Ba's liver.

This case was late for omphalopagus separation because their mother lived in a rural area without a surgery-capable referral hospital. Moreover, the scheduled separation was postponed from late March to September 2020 due to the uncertainty of healthcare during the early months of the COVID-19 pandemic in Indonesia. Fortunately, there were no partial membranous ruptures and pulled vena cava during the C-section labor. We assessed this case with POF, moderate pulmonary valve stenosis, failure to thrive, and hepatic-intestinal omphalopagus. We planned surgical separation with primary closure (Figure 3). The SARS-CoV-2 polymerase chain reaction (PCR) test was conducted one day before the surgery. It showed a negative result.

Intervention or Clinical Examination

The patients' mother gave written consent regarding the entire medical care and case presentation for the medical publication purpose. The written consent is available for review by the editorial board of this journal. The anesthesiologists considered inducing Be before Ba due to Be's cyanotic congenital heart disease (CHD) in one omphalopagus separation surgical table. Thus, the surgeons also prepared two surgery tables for the primary abdominal closure following omphalopagus separation

An incision was made in the marked skin, connective tissue, and muscles beneath (Figure 3). The fused portion of the liver was separated by harmonic scalpel instead of an electrosurgical instrument. The remaining fused parts were cut and resutured. The malrotated-intestines were corrected. We found unpredicted intraoperative findings included minor diaphragm defect and

Figure 1. Omphalopagus or conjoined twins in September 2020. (A, C) Baby Ba's hands and feet. (B, D) Baby Be's hands and feet.

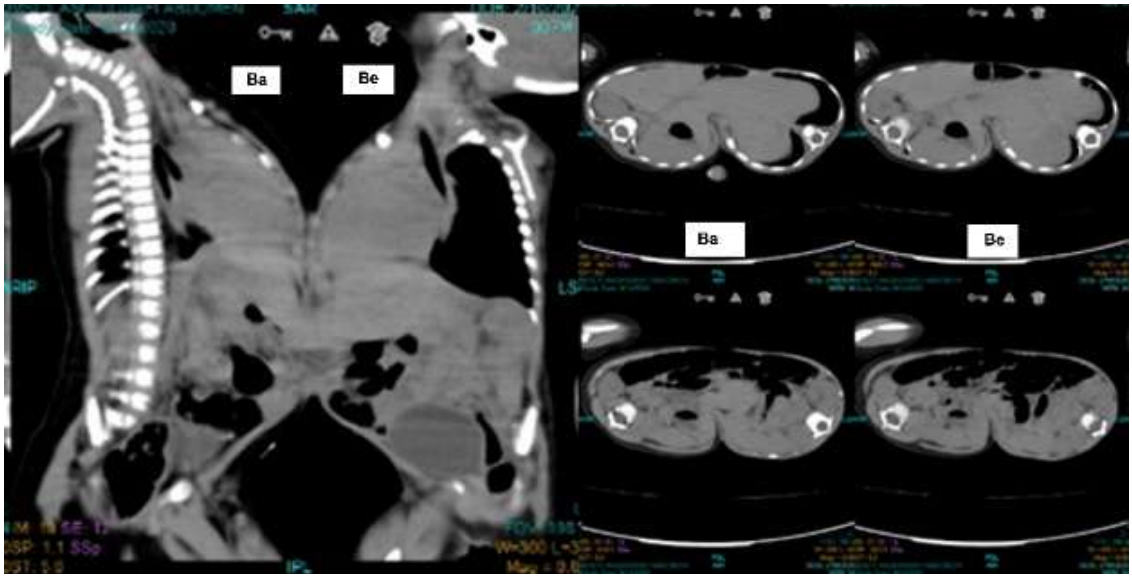

Figure 2. Pre-operative abdominal computerized tomography scan with contrast.

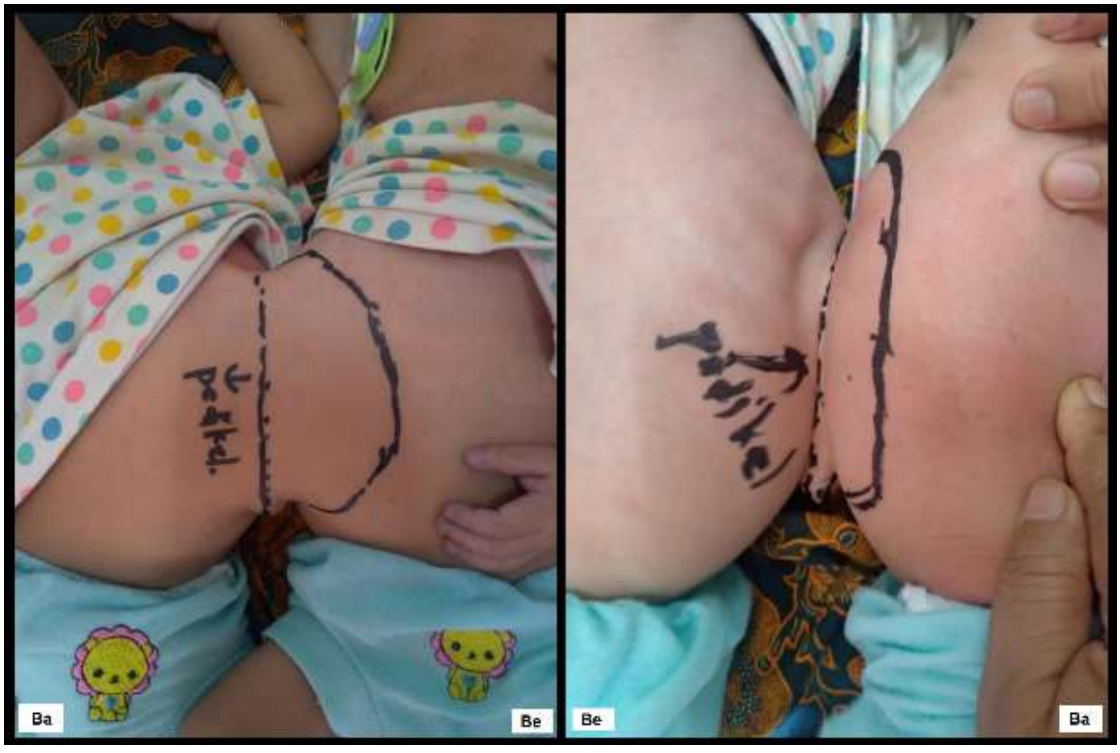

Figure 3. Surgical incision plan of omphalopagus separation. (Left) Anterior view. (Right) Posterior view.

underdeveloped ribs and sternum. Thus, the inferior portion of the sternum was connected to the cartilaginous rib with many ligations of secondary vascular connections. Finally, drainage and primary abdominal wall defect closure were performed using fascia and skin. The overall procedure took 10 hours to be accomplished. Be suffered oxygen desaturation, but returned to the normal range above 97% one-hour after the surgery. Furthermore, the babies received approximately 35 cc of packed red blood cells intraoperatively. They satisfactorily tolerated the surgery, and we extubated them two hours later. Our cardiothoracic-vascular and interventional radiologists colleagues suggested delaying Be's POF surgery until age five.

Figure 4. The twins on the seventh day of post-surgery.

Results

In the pediatric intensive care unit (PICU), Ampicillin-Sulbactam 50 mg/kg/12hours and Amoxicillin 45 mg/kg/12hours were administered intravenously until the ninth-day post-surgery to prevent MRSA infection (Nelson & Gallagher, 2012). Both babies also received antivirals (Lopinavir, Ritonavir), and Hydroxychloroquine due to high exposure and risk of COVID-19 infection and acute respiratory distress syndrome (ARDS) complications. The sutured skin was not infected (Figure 4). On the sixth-day post-surgery, we started to give 90 kcal/kg/day oral route feeding. The twins showed normal vital signs on the seventh days post-surgery. Meanwhile, Be remained cyanotic with 95% oxygen saturation. The SARS-CoV-2 PCR test results were negative before the hospital discharge. The patients were discharged after fifteen days. Two weeks later during hospital follow-up, they gained sufficient bodyweight of 10.3 kg and 10.1 kg for baby Ba and Be, respectively.

Discussion

Conjoined twins is an uncommon congenital case that leads to severe complications (Liu et al., 2021). The twins frequently share ventral parts of the cardiovascular and gastrointestinal systems. Omphalopagus twins are frequently connected to the umbilical cord, which involves the lower chest (Omran et al., 2020). However, the external anterior fusion is identical between the thoracopagus and omphalopagus. Thoracopagus has a conjunction of the heart, while omphalopagus refers to those with separate hearts (Osmanağaoğlu et al., 2011). These differences define the prognosis and treatment, in which thoracopagus are almost inseparable (Grizelj et al., 2019).

Although omphalopagus twins have the best chances of survival, the surgical timing remains controversial. Several months delay offers a better chance of survival (Patil et al., 2016). However, early separation is indicated when one twin worsens the other's hemodynamic circulation. However, significant cardiac anomalies are contraindicated for separations (Sultan & Tawfeek, 2016).

Before omphalopagus separation, we considered the age, shared organs, organ anomalies, and possible bones and soft tissue defects post-surgery to improve the post-surgical outcomes (Zainuddin et al., 2021). However, the COVID-19 pandemic caused several challenges leading to surgical delays (Byrnes et al., 2021). In the absence of contraindication, separation is usually performed at three months. Meanwhile, early separation may cause recovery and wound closure disturbance (Sandy-Hodgetts et al., 2015). Moreover, late separation of more than ten months old can worsen the lung infection risk and aesthetic-developmental aspects (Mian et al., 2017). Besides MRSA and COVID-19 infection, Necrotizing enterocolitis (NEC) is one of the most reported pre-surgery and post-surgery complications in the omphalopagus (Omran et al., 2020). In this case, the age of 14 months offered beneficial protection from NEC, as the intestinal tissue was not prone to inflammation

or perforation (Pammi et al., 2020). In regard to nursing role, the overall medical condition should be assessed to establish adequate care of nurse plan based on disease severity (Wahyuningsih et al., 2020). Thus, prevention of infection is a major concern in pediatric nursing care units (Okpara, 2018).

The primary limitation of this study is no well-established consensus for omphalopagus surgery before or during the COVID-19 pandemic era. However, this successful omphalopagus separation strengthens personal-to-personal approach as conjoined twins is a complex medical issues requiring multi-disciplinary team consideration (Giwangkancana et al., 2022). In this case, we performed early surgery when both babies were stable. We followed Centers for Disease Control and Prevention guidelines to prevent COVID-19 infection (Reich & Elward, 2022). We used an N95 mask and standardized-level-3 hazmat suits. We also restricted the number of operating room staff during surgery, despite this case involved multidisciplinary team intervention. A mandatory SARS-CoV-2 PCR was also tested to surgical teams.

Conclusions

A successful 10-hour omphalopagus separation was performed by pediatric, cardiothoracic, and plastic surgeons. In the early phase of the COVID-19 pandemic and with the lack of evidence-based recommendations for hospital care during COVID-19 in Indonesia, a well-established basic knowledge about the COVID-19 transmission routes and well-planned surgery strategies were mandatory to be understood. Aside from several surgical considerations, a life-saving omphalopagus separation from death due to complications of COVID-19 infection and ARDS must be prioritized. Moreover, nursing care should consider comprehensive outcome including history taking, patient assessment on admission, vital sign monitoring, operative care, especially prevention of infection in this present case. Furthermore, social-psychological-emotional supports could enhance the compliance to medication leading to better medical outcomes.

Declaration of Interest

The authors confirm that they have no competing interests.

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Data Availability

The supplementary data are available on reasonable request. Please contact by e-mail bellyndamonica@gmail.com.

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ST-Elevation myocardial infarction, severe cardiogenic shock, and myocarditis secondary to leptospirosis: A rare case report

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Abstract

Background: Leptospirosis is a bacterial infection that can lead to several organ dysfunctions. The unknown pathogenesis and association between leptospirosis and cardiac involvements can lead to a diagnostic challenge and case rarity. This study aims to report a diagnosis challenge through physical and laboratory examination of a patient with ST-elevation myocardial infarction (STEMI) and myocarditis without common leptospiral-associated organ dysfunction features.
Case: A 35-year-old male patient came to the emergency department with flu-like symptoms. Twenty-four hours later, the patient showed acute angina, STEMI, and elevated high-sensitivity cardiac troponin followed by cardiogenic shock without significant modifiable and non-modifiable risk factors for heart diseases. The patient received fibrinolytic, supportive therapy and correction of hemodynamic derangement. We found thrombocytopenia on the second day. Surprisingly, the immunoserology showed positive anti-leptospira IgM and negative anti-dengue IgM and IgG. Direct cardiac tissue damage due to systemic vasculitis, disseminated intravascular coagulation, and pro-inflammatory cytokine storm is believed to be pathomechanism in leptospirosis with cardiac involvement. After diagnosis establishment, his final therapies in the hospital were Aspirin, Atorvastatin, Clopidogrel, Spironolactone, Ramipril, Carvedilol, Omeprazole, Doxycycline, and Ceftriaxone. Subsequently, he was discharged from hospital and continued to receive cardiovascular medications, antibiotics, antiplatelet, potassium-sparing diuretics, and omeprazole.
Conclusion: This case highlights the importance of thorough clinical-laboratory evaluation in a patient with an atypical leptospiral presentation. Although leptospirosis is not a common cause of heart diseases such as STEMI, cardiogenic shock, and myocarditis, we recommend supportive therapy and correction of hemodynamic derangement for leptospirosis with cardiac involvement, in addition to leptospiral antibiotic drug itself.

Keywords: cardiogenic shock; heart disease; leptospirosis; myocardial infarction; myocarditis

Introduction

Leptospirosis is a zoonosis disease caused by the spirochete of the genus Leptospira (Evangelista & Coburn, 2010). It is a relatively neglected disease, and transmission is more favorable in tropical and urban slum

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environments (Monteiro et al., 2021). The brown rat, Rattus norvegicus, is the primary source of human infections, while several wild and domestic animals can become reservoir hosts (Haake & Levett, 2015). A study showed that a considerable degree of morbidity (48%, 95% CI 0.40–0.61) and mortality rate (42%, 95% CI 0.34–0.53) occurs in males aged 20–49 worldwide (Costa et al., 2015). The penetration route of this pathogen includes the skin through abrasion or cut and the conjunctival or oral mucous membranes (De Brito et al., 2018). Its incubation period ranges from 7-12 days, although it can be three days or a month (Haake & Levett, 2015). Later, the hematogenous dissemination causes widespread symptoms ranging from a mild febrile illness to severe multiple organ failure, known as Weil's disease, and death (Rajapakse, 2022).

Severe leptospirosis is known to cause atypical organ dysfunction of cardiac involvement (Mathew et al., 2020). However, the extent of cardiac diseases following leptospirosis is uncertain and underreported (Navinan & Rajapakse, 2012). Thus, we report a rare case of non-severe leptospirosis with cardiac involvement, including ST-elevation myocardial infarction (STEMI), severe cardiogenic shock, and myocarditis at UNS Hospital, Surakarta city, Indonesia.

Case Presentation

A 35-year-old male patient was admitted to the emergency department on June 21, 2022, with fever for three days, myalgia in his calves, nausea, vomiting, and diarrhea. He worked as a handyman and lived close to the rice fields. There was no recent contact with wild or domesticated animals. No history of hypertension, diabetes and allergies were found. He had quit smoking for more than ten years. Further evaluation revealed low addiction for the Heaviness of Smoking Index (HSI).

On physical examination, his temperature was 37.9oC with epigastric pain. There were no icterus and signs of bleeding. Laboratory tests (Table 1) showed lymphopenia, neutrophilia, decreased renal function, and negative HbsAg and SARS-CoV-2. Stool examination showed epithelial cells and leukocytes. The patient was initially diagnosed with a common cold, acute gastroenteritis, and acute kidney injury without any specific laboratory findings.

After 24 hours of hospitalization, the patient complained of retrosternal chest pain. Electrocardiogram (ECG) showed ST segment elevation in V1-V6 leads. Elevated high-sensitivity cardiac troponin (hs-cTn) was also detected. Hence, the patient was diagnosed with anterolateral ST elevation myocardial infarction (STEMI). This STEMI

Table 1. Important Laboratory Profiles of The Patient

Dates	Laboratory Findings	Interpretation
June 21, 2022	Lymphocytes 5.3% (N: 22.0-44.0), Neutrophil 91.3% (N: 50.0-70.0), Ureum 65 mg/dl (N: 10-45), Creatinine 1.69 mg/dl (N: 0.50-1.10), SGOT 16U/L (N: 8-37), SGPT 13U/L(N: 8-40), HbsAg non reactive; Stool examination: epithelial cells 0-3 (N: 0), WBC 1-2 (N:0), cyst (-), bacteria (-), eggworms (-)	Lymphopenia, neutrophilia, and decreased renal function were found; Diarrhea due to bacteria and parasite infection were excluded.
June 22, 2022	hs-cTn 27542 ng/l (N: 0-2)	Elevated hs-cTn support the diagnosis of myocardial infarction.
June 23, 2022	Haemoglobin 11.5 g/dl (N:13.5-17.5), RBC 4.17x106/µl (N: 4.50-5.90x106/micL) MCV 79.9/UM (N: 80.0-96.0), MCH 27.6 pg (N: 28.0-33.0), Thrombocytes 71x103/µl (N: 150-450x103/micL), TC 95 mg/dl (N: 0-200), HDL cholesterol 9 mg/dl (N: 30-71), LDL cholesterol 41 mg/dl (N: < 100), TG 147 mg/dl (N:<150)	Microcytic hypochromic anemia and thrombocytopenia were found; Dengue fever was considered as the initial diagnosis; Low HDL level was the only abnormality found in lipid profile examination as a risk factor for ACS.
June 24, 2022	anti-leptospira IgM (+)	Diagnosis of leptospirosis was established.
June 29, 2022	anti-dengue IgM and IgG (-)	Diagnosis of Dengue fever was excluded.

N, normal range; SGOT, Serum Glutamic Oxaloacetic Transaminase; SGPT, serum glutamic-pyruvic transaminase; HbsAg, Hepatitis B surface antigen; hs-cTn, high-sensitivity cardiac troponin; STEMI, ST Elevation Myocardial Infarction; ACS, acute coronary syndrome; HDL, high-density lipoprotein; LDL, low-density lipoprotein; IgM, Immunoglobulin M; IgG, Immunoglobulin G; RBC, red blood cell; TC, total cholesterol; TG, triglyceride.

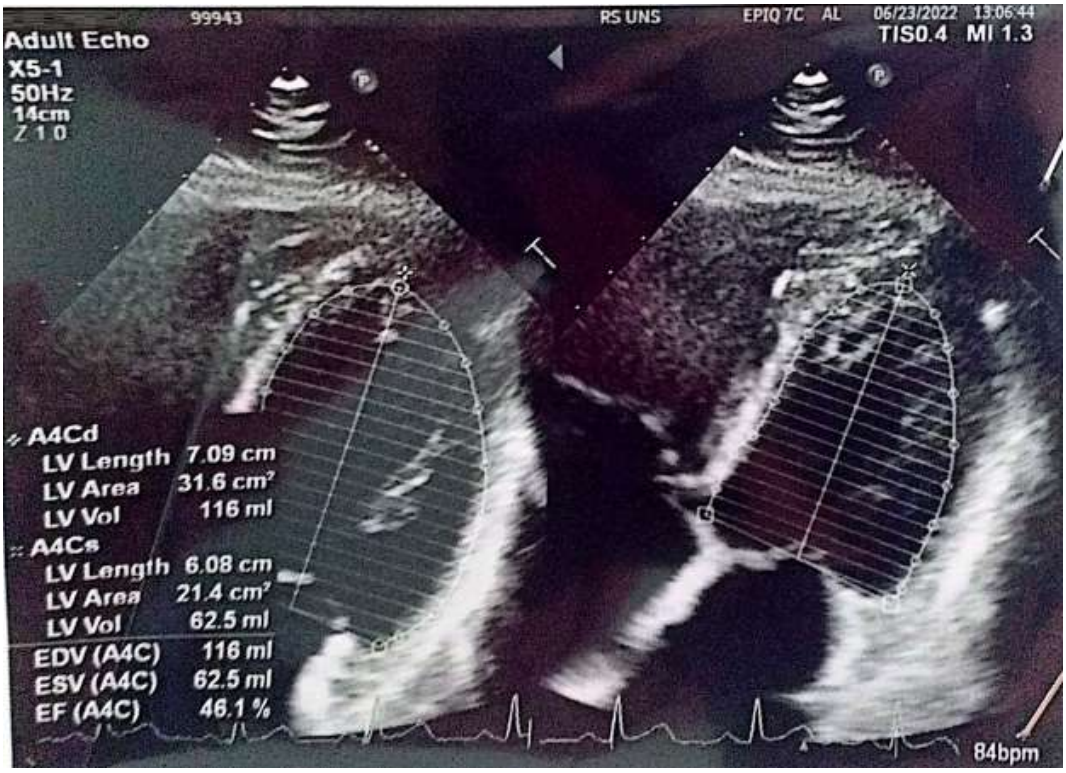

Figure 1. Echocardiography illustrated mild mitral and tricuspid regurgitation, mild regional wall motion abnormalities, grade-3 left ventricle (LV) diastolic dysfunction, and amplified echogenicity of the lateral LV endocardium. Based on the Simpson method, the left ventricular systolic function was mildly reduced, with a 46.1% LV ejection fraction.

circumstance is relatively uncommon in young adult patients with low-grade HSI and without a history of hypertension and diabetes. The lipid profile only showed low-level of high-density lipoprotein (HDL) with normal total cholesterol (TC) and low-density lipoprotein (LDL) levels (Table 1). Acute coronary syndrome (ACS) protocol was performed with the administration of sublingual Isosorbide dinitrate (ISDN) 5 mg, Aspirin loading dose 320 mg, and Clopidogrel 300 mg (de Alencar Neto, 2018).

Within the onset of anterolateral STEMI, the patient experienced a severe cardiogenic shock. The blood pressure was 55/40 mmHg, heart rate 93x/minute, respiratory rate 24x/minute, SpO2 91% on nasal cannula 5 lpm, and improved up to 99% on non-rebreathing mask 10 lpm. Acral coldness and prolonged capillary refill time were found. The patient was then transferred into the High Care Unit (HCU).

The treatment in HCU included adequate oxygenation, norepinephrine 0.01 mcg/kg bodyweight/minute, and 5 mg dexamethasone intravenous (IV). The patient did not have any absolute contraindication of fibrinolytic. Streptokinase 1.5 million units and heparin 60 IU/kg bodyweight were administered since percutaneous coronary intervention (PCI) is unavailable in our hospital. Heparin continued at 12 IU until the fifth day (Ibanez et al., 2018).

On the second day, a routine complete blood count test showed hypochromic microcytic anemia, leukocytosis with lymphopenia, neutrophilia, and thrombocytopenia. We suspected leptospirosis and dengue hemorrhagic fever (DHF). Further tests showed positive anti-leptospira IgM and negative anti-dengue IgM and IgG (Table 1). Echocardiography was conducted due to the presence of fine crackles and revealed myocarditis (Figure 1).

Results

We diagnosed leptospirosis, myocarditis, and STEMI with severe cardiogenic shock. Leptospirosis and cardiac involvement is a rare coincidence as leptospiral vasculitis usually does not involve cardiac tissue. Further evaluation showed no evidence of Weil's disease due to the absence of refractory shock, pulmonary hemorrhage, and jaundice (Satiya et al., 2020). Pharmacology therapies included Aspirin 80 mg o.d., Atorvastatin 40 mg o.d., Clopidogrel 75 mg o.d., Spironolactone 50 mg o.d., Ramipril 2.5 mg b.i.d., Carvedilol 6.25 mg b.i.d., Omeprazole 40 mg IV o.d., Doxycycline 100 mg b.i.d., and Ceftriaxone 2 g IV o.d.

The patient was discharged from HCU to the hospital ward on the sixth day of hospitalization. He continued to receive Omeprazole 40 mg IV o.d., Doxycycline 100 mg b.i.d., Ceftriaxone 2 g IV o.d. On the ninth day, he was discharged from the

hospital. Home remedies included cardiovascular medications, antibiotics, antiplatelet, potassium-sparing diuretics, and omeprazole. One week later, the patient was doing well. No recurrence of symptoms was reported during hospital follow-up.

Discussion

Leptospirosis is a fatal zoonosis and can cause significant epidemics following periods of heavy rainfall and flooding (Monteiro et al., 2021). We suspected that the patient was infected by leptospiral-contaminated wet soil. Our patient presented with a nonspecific-acute febrile, nausea, vomiting, and diarrhea with severe myalgia in both his calves. Those symptoms may be diagnosed as influenza, DHF, dengue fever, typhoid fever, other enteric fever, and hepatitis A (Warnasekara et al., 2022). Typhoid fever was excluded because of the absence of stepladder pattern fever (Britto et al., 2017). Hepatitis A was not considered because we found no jaundice and no history of food or water ingestion that had been contaminated with the stool of an infected and jaundice person (Becirovic et al., 2020).

Thrombocytopenia can be found in either early DHF or late complications of severe leptospirosis (Costa et al., 2015). However, we did not consider DHF diagnostic because of negative results of anti-dengue IgM and IgG. The microscopic agglutination test (MAT) is the gold standard for diagnosing most leptospirosis-suspected patients (Haake & Levett, 2015). However, due to the lack of accessibility to MAT in our hospital, this case diagnosis was established by IgM-anti leptospiral antibody detection. Several studies showed that IgM-anti leptospiral had average specificity and sensitivity of 84.5-73.3% and 86.0-87.4%, respectively (Costa et al., 2015).

The cardiac involvement pathomechanism in leptospirosis is poorly studied (Misra & Shenoy, 2017). In t mild-moderate leptospirosis, systemic vasculitis is exacerbated by direct tissue damage by leptospiral, disseminated intravascular coagulation, and cytokine storm with higher titers of IL-6, IL-10, and TNF-α are assumed to result in coronary endothelial dysfunction and heart muscle damage (Navinan & Rajapakse, 2012). A study found that interstitial myocarditis, an abnormal histopathological change with cellular infiltrate, accounted for 96% of postmortem studies of severe leptospirosis (Costa et al., 2015).

Given the lack of advance-definitive diagnostic approaches such as echocardiography and myocardial biopsy, a cardiologist's working group has developed clinical and diagnostic criteria for myocarditis in leptospirosis and other vasculitis-based diseases (Costa et al., 2015). These criteria include unexplained severe cardiogenic shock, positive hs-cTn, and non-specific variable ECG changes. These ECG changes can be bundle branch blocks, STEMI, atrial fibrillation, first-and-third-degree heart block, ventricular and supraventricular extrasystoles, changes in the P-QRS-T complexes, low voltage QRS complexes, and ST-T wave disturbances (Costa et al., 2015).

Our patient received oral doxycycline due to the absence of Weil's disease signs and symptoms. Mild leptospirosis therapy options include oral Doxycycline and Amoxicillin. Meanwhile, high-dose intravenous Penicillin G still becomes the drug of choice in severe cases (Rajapakse, 2022). The third-generation Cephalosporin such as Cefotaxime and Ceftriaxone have shown promising outcomes in recent clinical trials (Rajapakse, 2022). However, no specific and evidence-based therapies are available for cardiac leptospirosis; current treatments are supportive therapy and correction of hemodynamic derangement in the intensive or high care unit (Navinan & Rajapakse, 2012). In our case, anterolateral STEMI was treated according to ACS guidelines. An inotropic agent was administered to preserve hemodynamic stability during cardiogenic shock (Shah et al., 2019).

Cardiac involvement is usually found in severe leptospirosis patients and is related to a 43% mortality rate (Navinan & Rajapakse, 2012). Myocarditis, pericarditis, arrhythmias, cardiogenic shock, massive bleeding of the myocardium, STEMI, and congestive heart failure are associated with acute stages of cardiac morbidity and mortality in leptospirosis patients (Rajapakse, 2022). Different innate immune response may cause cardiac involvement, in our mild case leptospirosis. It plays a crucial role in early recognition and elimination of the bacteria. The immune reaction will result in pathogen recognition receptors (PRRs) recognizing pathogen-associated molecular patterns. Those two dominant PRRs are Toll-like receptors (TLRs) and the Nod-like receptors (NLRs). In leptospirosis, TLR2 and LTR4 are the most identified PRRs (Fraga et al., 2011). They cause chemokine dependent response and pro-inflammatory cytokine; however, despite leptospiral the carbohydrate moiety of leptospiral lipopolysaccharide (LPS) is less endotoxic (Chen et al., 2020). This lower LPS endotoxicity profile explained the mild leptospiral in our rare case.

This study has some limitations. The MAT is unavailable in our hospital. Hence, we recommend our hospital and all secondary-to-tertiary referral hospitals to provide a MAT diagnostic facility (Gasem et al., 2020). This case was relatively mild-to-moderate leptospirosis, yet the patient suffered severe cardiac involvement of STEMI and severe cardiogenic shock. Meanwhile, several studies of cardiac involvement have been reported in severe leptospirosis. Clinical outcomes of leptospirosis with cardiac involvement in our country are also unclear since there is a lack of reported cases despite high leptospirosis incidence in the rainy season and flood-prone areas.

Conclusions

The cardiac involvement of STEMI, cardiogenic shock, and myocarditis in a leptospiral-suspected patient can cause medical overdiagnosis, although those are secondary to leptospirosis. This atypical organ dysfunction is difficult to describe because of the lack of clear criteria to define cardiac involvement. The possible co-infection of enteric and dengue fever in leptospirosis should also be evaluated in the physical-laboratory examination and treatment, especially in tropical-endemic countries. Supportive, hemodynamic derangement, and antibiotic therapies should be addressed in leptospirosis with cardiac involvement.

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Ethics statement
Written informed consent was obtained from the patient. This study is approved by Health and Research Committee of Dr. Moewardi Hospital (No.013/I/HREC/2023).

Data Availability
Please contact on reasonable request: coana.sg@staff.uns.ac.id.

Conflict of Interests
The authors have no conflict of interests.

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