

i-SPiKE 2023

INTERNATIONAL EXHIBITION & SYMPOSIUM ON PRODUCTIVITY, INNOVATION, KNOWLEDGE & EDUCATION

“Optimizing Innovation in Knowledge, Education and Design”

EXTENDED ABSTRACT



e ISBN 978-967-2948-56-8



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Cover design : Syahrini Shawalludin
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eISBN 978-967-2948-56-8

Published by:
Universiti Teknologi MARA (UiTM) Cawangan Kedah,
Sungai Petani Campus,
08400 Merbok,
Kedah,
Malaysia.

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Assalamualaikum warahmatullahi wabarakatuh,




First and foremost, I would like to express my gratitude to the organizing committee of i-Spike 2023 for their tremendous efforts in bringing this online competition a reality . I must extend my congratulations to the committee for successfully delivering on their promise to make i-Spike 2023 a meaningful event for academics worldwide.

The theme for this event, 'Optimizing Innovation in Knowledge, Education, and Design,' is both timely and highly relevant in today's world, especially at the tertiary level. Innovation plays a central role in our daily lives, offering new solutions for products, processes, and services By adopting a strategic approach to 'Optimizing Innovation in Knowledge, Education, and Design,' we have the potential to enhance support for learners and educators, while also expanding opportunities for learner engagement, interactivity, and access to education.

I am awed by the magnitude and multitude of participants in this competition. I am also confident that all the innovations presented have provided valuable insights into the significance of innovative and advanced teaching materials in promoting sustainable development for the betterment of teaching and learning. Hopefully, this will mark the beginning of a long series of i-Spike events in the future.

It is also my hope that you find i-Spike 2023 to be an excellent platform for learning, sharing, and collaboration. Once again, I want to thank all the committee members of i-Spike 2023 for their hard work in making this event a reality I would also like to extend my congratulations to all the winners, and I hope that each of you will successfully achieve your intended goals through your participation in this competition.

Professor Dr. Roshima Haji Said
RECTOR
UiTM KEDAH BRANCH



WELCOME MESSAGE (i-SPIKE 2023 CHAIR)

We are looking forward to welcoming you to the 3rd International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education 2023 (i-SPIKE 2023). Your presence here is a clear, crystal-clear testimony to the importance you place on the research and innovation arena. The theme of this year's Innovation is "*Optimizing Innovation in Knowledge, Education, & Design*". We believe that the presentations by the distinguished innovators will contribute immensely to a deeper understanding of the current issues in relation to the theme.

i-SPIKE 2023 offers a platform for nurturing the next generation of innovators and fostering cutting-edge innovations at the crossroads of collaboration, creativity, and enthusiasm. We enthusiastically welcome junior and young inventors from schools and universities, as well as local and foreign academicians and industry professionals, to showcase their innovative products and engage in knowledge sharing. All submissions have been rigorously evaluated by expert juries comprising professionals from both industry and academia.

On behalf of the conference organisers, I would like to extend our sincere thanks for your participation, and we hope you enjoy the event. A special note of appreciation goes out to all the committee members of i-SPIKE 2023; your dedication and hard work are greatly appreciated.

Dr. Junaida Ismail

Chair

3rdInternational Exhibition & Symposium Productivity, Innovation, Knowledge, and Education 2023 (i-SPIKE 2023)

KAECPR APP

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ABSTRACT

Death from ischemic heart disease (IHD) has become the top cause of death in Malaysia for the past two decades. Consequences of IHD include cardiac arrest events, whereas cardiopulmonary resuscitation (CPR) skills and knowledge are crucial. However, the knowledge and skills of CPR may decline as early as three months after certification. The KAECPR App was developed to evaluate the knowledge, attitudes and self-efficacy (KAE) level of adult CPR among healthcare providers. Through its easy user interface and mechanism for users to monitor and refresh their CPR knowledge and skills at all times and settings, this is the first application in Malaysia to provide a questionnaire on KAE towards adult CPR among healthcare providers, and it is developed in the Malay language for better understanding and outcomes. This app might benefit all users by monitoring their level of KAE on adult CPR and creating awareness to improve their KAE on adult CPR. Furthermore, additional features to assess the attitudes toward CPR training and practices are also beneficial for the employers through the cumulative database to monitor the level of KAE among their employees and as a baseline to develop training programs suitable for their employee's needs. This application may be used to assess Basic Life Support pre and post-test. It may be expanded to other Basic Life Support procedures, such as CPR among paediatric and choking management, with additional video learning features to fulfil the different learning styles.

Keywords: KAECPR, Knowledge, Attitudes, Self-efficacy, Adult CPR, mobile app.

INTRODUCTION

The Knowledge, Attitudes and Self-efficacy on Adult Cardiopulmonary Resuscitation among Healthcare Providers (KAE-CPR) questionnaire was developed earlier. During the pilot study and data collection progress to targeted respondents, we realised that there is a potential to develop an app, to be useful in assessing KAE-CPR to create awareness, monitoring and reduce time consumption. Ischemic heart disease (IHD) has become the top cause of death for the past two decades (Department of Statistics Malaysia, 2021). Therefore, all categories of healthcare providers should be ready for any consequences of IHD cases, for example cardiac arrest. In contrast, the ability to perform early CPR and defibrillator should be top-notch at any time. Adequate knowledge, training and experience involved in managing patients with cardiac arrest and CPR activities will increase awareness and self-efficacy in learning and performing CPR (Cartledge et al., 2019; Guteta, 2022; Hawkes et al., 2019; Pivač et al., 2020). In current practice, all healthcare providers will sit for the Basic Life Support (BLS) course as a mandatory course, which is recertified every two years in many healthcare facilities (Mcevoy et al., 2018). In addition, the Advanced Life Support course certification is required for some healthcare providers working in acute and critical care settings such as emergency and trauma departments and intensive care units (Ministry of Health Malaysia, 2021). However, in the previous study, it is found that CPR skills, knowledge and self-efficacy significantly decline as early as three months after certification (Mcevoy et al., 2018; Partiprajak & Thongpo, 2016; Umuhoza et al., 2021). Other factors, such as serving in remote facilities for a long period and not being exposed to emergency cases needing their skills and knowledge in CPR, will affect adult CPR performance (Guteta, 2022; Kaihula et al., 2018; Sivrikaya et al., 2022; Zhrebovich et al., 2021). Knowing that the ability to perform CPR is crucial among healthcare providers, and based on previous experience conducting data collection on KAE-CPR using hardcopy questionnaires, which involves a lot of time consumption. Therefore, there is a need to develop an application that is useful for assessing KAE-CPR among healthcare providers, to create awareness of the need to update healthcare provider's CPR knowledge and skills and the employers or management to monitor their employees level of KAE-CPR using the convenient way, fast and accurate testing question.

PROBLEM STATEMENTS

Previous literature review showed that no app or questionnaire was developed to assess the level of knowledge, attitudes and self-efficacy among healthcare providers, especially in Malaysia, before the first version of the KAE-CPR questionnaire was developed. From the experience of distributing questionnaires to all respondents during the pilot study and data collection, there is a potential to develop an application to assess the KAE-CPR. Each healthcare provider must have essential knowledge, good attitudes and self-efficacy to effectively provide adequate care to patients in cardiac arrest (Alamri & Baker, 2022). However, a previous study showed that working for an extended period without practising CPR will decrease the level of KAE-CPR among healthcare providers as early as three months after certification (Guteta, 2022; Partiprajak & Thongpo, 2016; Umuhoza et al., 2021; Zhrebovich et al., 2021). For this concern, the KAECPR App was developed to help the user (healthcare providers) to monitor their level of KAE on adult CPR and create an awareness to improve their KAE on adult CPR and help top management in the organisation to create a baseline of their employee's KAE-CPR to develop a suitable training program.

DEVELOPMENT OF KAECPR APP

The KAECPR App was developed based on the current CPR guidelines with additional attitudes on adult CPR training and practices and self-efficacy towards CPR steps and procedures. In this first version of the KAECPR App, 14 items on knowledge, ten on attitudes and 20 on self-efficacy on adult CPR are applied. For the development of a prototype of the KAECPR App, Adalo: Design & Build Custom Apps used. This prototype developer is free and can be previewed on the website. This KAECPR App interface consists of a register/log-in button, introduction and consent agreement, type of assessment, question, and feedback. For content validation, the KAECPR questionnaire's hardcopy went through the validation (content validation and face validation) and reliability test. The questionnaire was validated by the experts such as emergency physicians, family medicine specialists, BLS instructors and lecturers. The draft of the storyboard and content of the apps are presented once again to the expert panels, and all comments are identified for improvement. Finalise KAECPR App will be published at the Google PlayStore for Android mobile phones and App Store for IOS users to download.



Figure 1: KAECPR App Interface

BENEFIT AND FUTURE DIRECTION OF THE KAECPR APP

In current medical practices, fast, convenient and accurate application in assessment is needed. This application will be beneficial to all users (healthcare providers) to monitor their level of KAE-CPR anytime and anywhere; this monitoring system will help to create awareness among healthcare providers to increase their KAE on adult CPR and as a medium to refresh their knowledge in accordance to newly CPR guidelines. This app is also beneficial to employers to assess the level of KAE on adult CPR among their employees and to develop or suggest appropriate training activities to improve the level of KAE on adult CPR among their employees. In the future, an expanded version of the KAECPR App is suggested to be developed by considering the other Basic Life Support procedures (paediatric CPR and choking) with video features to support different learning styles among users. It is also suggested to use KAECPR as an instrument in pre and post-test of Basic Life Support training to cut the time in distributing questions, checking correct answers and reducing printing costs.

ACKNOWLEDGEMENTS

We want to acknowledge the Universiti Teknologi MARA for the Geran Insentif Penyeliaan (GIP) (600-RMC/GIP 5/3 (108/2022) for financial support throughout this study.

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e ISBN 978-967-2948-56-8

