STUDY PROTOCOL

Resilience and Return to Work among Individuals with Chronic Illness: A Mixed-Methods Study Protocol

Amirul Ashraf Khairizal[1], Siti Salwana Kamsan[1,2] Muhammad Kamil Che Hasan[3], Nik Nur Fatnoon Nik Ahmad[4], Munayati Munajat[1], Tan Maw Pin[5]

[1] Department of Physical Rehabilitation Sciences, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, 25200, Kuantan Pahang, Malaysia.
[2] Children Health and Wellbeing Research Group, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, 25200, Kuantan Pahang, Malaysia.
[3] Kulliyyah of Nursing, International Islamic University Malaysia, 25200, Kuantan Pahang, Malaysia.
[4] Kulliyyah of Medicine, International Islamic University Malaysia, 25200, Kuantan Pahang, Malaysia.
[5] Faculty of Medicine, University Malaya, 50603, Kuala Lumpur, Malaysia.

ABSTRACT

Introduction: Chronic illnesses, including cardiovascular diseases, kidney failure, diabetes mellitus, hypertension, and cancer are long-term medical conditions necessitating continuous medical management. The impacts of chronic illnesses on the workforce are detrimental particularly in manual labour jobs. High sick leave, productivity loss, and early retirement are among the most common repercussions of chronic illnesses that affect job retention. To remain in the workforce, individuals need to be resilient in navigating health challenges. Hence, the associated factors influencing resilience must be thoroughly examined. **Methods:** This study will employ a mixed-methods approach, incorporating both quantitative and qualitative studies in two phases. Phase I will involve a cross-sectional study of 400 individuals with chronic illnesses. Several sets of validated questionnaires will be used to examine the level of resilience and the associated factors. The data will be analysed using the Statistical Package for the Social Sciences (SPSS). In Phase II, focus group discussions involving 40 individuals with chronic illnesses will be employed to elucidate the extent to which the illnesses influence resilience and to explore any additional factors contributing to resilience to return to work. Open-ended questions will be used to collect the qualitative data. The data will then be analysed using a thematic approach. **Discussion:** With the increasing prevalence of chronic illnesses, factors that contribute to resilience should be identified in order to inform future strategies or to promote initiatives to support individuals with chronic illnesses in returning to the workforce.
Malaysian Journal of Medicine and Health Sciences (2026) 22(1): 1-7. doi:10.47836/mjmhs.v22.i1.1464

Keywords: Chronic illness, Chronic disease, Resilience, Return to work, Workforce

Corresponding Author:
Siti Salwana Kamsan, PhD
Email: sitisalwana@iium.edu.my
Tel: +6095716400 (ext:3387)

INTRODUCTION

Chronic illnesses, also known as chronic disorders, are long-term medical conditions. The predominant chronic illnesses contributing to morbidity and mortality include cardiovascular diseases, kidney failure, uncontrolled diabetes, hypertension, chronic respiratory diseases, arthritis, and cancer (1). Despite advancements in contemporary medicine, most of the chronic illnesses remain incurable as their nature is irreversible, ongoing, and progressive (2). Consequently, living with chronic illnesses is incredibly challenging as the prolonged symptoms of chronic illnesses have a detrimental effect on many aspects of life (3).

According to the survey, the prevalence of chronic illnesses among people in the working population is considerably high, with over 30% affected by at least one chronic illness (4). Similarly in Malaysia, nearly 50% of the working population have been suffered with chronic conditions (5,6). Such debilitating health conditions have a direct impact on the work productivity mainly for jobs that involve manual labour, irrespective of the type of illness.

The incidence of chronic illnesses has been reported to cause a high sick leave usage in the working population

(6). Frequent absenteeism due to the illnesses may lead to income deduction and, in the worst case scenario, lead to a complete job loss, resulting in unemployment and poverty (6,7). To mitigate the risk of job termination, individuals who suffer from chronic illnesses often have to be consistently present at the workplace even when their working capacity is poor. This phenomenon can eventually lead to early retirement when the individuals are unable to fulfil the job requirements efficiently.

The current rate of unemployment among the chronic illness population is distressing. Data have shown that chronic illnesses are highly associated with functional limitations and unemployment, with up to 60% of chronic illnesses sufferers was reported to be unemployed (8). As the chronic illnesses demand a prolonged medical management, significant loss of income may lead to financial pressure on unemployed individuals and in turn affect their access to treatment, which adversely interferes with disease control (9).

Resilience enables individuals to navigate their health challenges (10). However, the level of resilience among individuals suffering from chronic illness has been found to be lower than that of healthy individuals (11). Poor resilience leads to low coping mechanism, elevated stress levels, and loss of functioning, while high resilience is associated with a better quality of life (12). Although the importance of building resilience has been emphasised in the literature, research question regarding factors contributing to resilience to return to work (RTW) remains unanswered. RTW has been defined as a process that supports the employees in resuming work after absenteeism, regardless the absence is short-term or long-term (13). In this context, the scope of RTW encompasses any form of reintegration into the workforce.

To date, the researcher is unaware of any studies exploring the resilience factors that facilitate RTW among the population with chronic illnesses specifically in Malaysia. This study will focus on individuals in low- and middle-income categories as research indicates that the prevalence of chronic illnesses among financially disadvantaged economic groups is higher compared to the affluent groups (14). In Malaysia, specifically, the prevalence of chronic illnesses is notably higher in low- and middle-income groups, reaching up to 50%, compared to the high-income group (15,16).

This study will use a mixed-methods design as it enables the researcher to obtain comprehensive understanding about resilience and RTW. The methodology of this study aims to address the following research questions:

1. What is the perception of individuals with chronic illnesses on their level of resilience?
2. What are the factors contributing to resilience in individuals with chronic illnesses?
3. How the factors identified in Phase I influence the level of resilience, and which factors can enhance resilience to return to work in individuals with chronic illnesses?

METHODS

An explanatory sequential mixed-methods approach will be employed in this study. This approach will incorporate the quantitative and qualitative information, providing diverse understanding that may not be possible through a single methodological approach (17). This study will initially analyse quantitative data, followed by conducting the qualitative study. Then, the quantitative and qualitative data will be integrated in the data interpretation stage. The qualitative findings will be used to complement, validate and further explain the survey findings which will be visually through a joint display table. The flow of study is outlined in Fig. 1. The study will be conducted in Kuantan, the capital of Pahang, which is a large state situated in the east coast of Peninsular Malaysia.

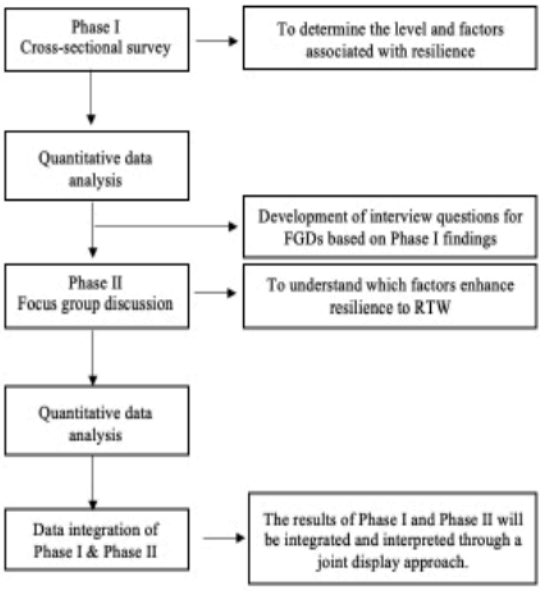

Fig. 1: The flow of study

Phase I – Quantitative Study

The objective of Phase I is to determine the level of resilience and the factors contributing to it in individuals living with chronic illnesses. A cross-sectional study design will be employed in this phase and the protocol will be in accordance with the STROBE (Strengthening the Reporting of Observational studies in Epidemiology) guideline.

Study Population and Participants Recruitment

The study population will be among low- and middle-income individuals who have been diagnosed with any chronic illnesses. The classifications of income will be determined according to the income brackets set by

the Malaysian Government, with household earnings below RM5,000 will be classified as low-income, while those earning between RM50001 to RM10,000 will be identified as middle-income. Further details about the income brackets can be obtained from the Department of Statistics Malaysia information website.

According to the sample size calculation performed with G*Power statistical software 3.1 using a power-based approach and parameters of 80% power, 5% alpha error, and odds ratio of 1.41 (Weerdesteijn et al. 2020), 400 participants will be required in this study. Participants who are between 20 and 55 years old (reflecting the core working-age group), have been diagnosed with any chronic illnesses for three years or more, and experience general chronic illness symptoms such as pain, discomfort, fatigue, numbness, lack of energy, body weakness, difficult to sleep, and have limited physical activities, will be invited to participate in the study. Participants will be excluded if they are unable to understand English or Malay language or if they are terminally ill. The participants will be recruited based on a convenience sampling strategy. To mitigate the drawbacks of the sampling strategy, the questionnaires will be distributed at different locations in Kuantan to obtain diversification of the target population.

Potential participants will be identified from the selected healthcare centres and several low- and middle-income neighbourhoods in Kuantan, Pahang. Participants identified from the healthcare database will be invited to participate in the study either through phone calls or through face-to-face communication at the clinic. Additionally, participants from low- and middle-income neighbourhoods will also be approached after disseminating posters about the study. The posters will be distributed by the neighbourhood representatives through social media chat groups, and those who are eligible and willing to participate are requested to contact the researcher.

Data Collection and Research Instruments

The data will be collected using survey questionnaires. The questionnaires will be administered by a researcher with clinical experience in RTW programme. The researcher will briefly explain the questionnaire to the participants. Then, participants will be given the option to answer the questionnaire either independently or with the researcher's assistance. As for the research instrument, several sets of questionnaires that are freely accessible, validated, and culturally adapted for the Malaysian population will be used. As the selected questionnaires have undergone the process of cultural adaptation in other studies, the questionnaires will be available in both English and Malay languages. A written permission to utilise the questionnaire will be obtained from the original author or any relevant organisations, and they will be acknowledged accordingly.

To determine the level of resilience, the Brief Resilience Scale (BRS) will be used. This scale demonstrates good reliability metric in assessing resilience in response to stressors (Cronbach's $\alpha = 0.806$) (18). The six items of the questionnaire are scored on a five-point rating scale. The total score will then be divided by six, and the average score will indicate the level of resilience. Scores ranging from 1.00 to 2.99 will be considered indicative of low resilience, scores from 3.00 to 4.30 will indicate normal resilience, and scores from 4.31 to 5.00 will indicate high resilience.

The associated factors of resilience will be examined through several elements, as outlined in the Dimension of Resilience Model, namely personal, physical, and psychological. The personal element will focus on socio- and clinico-demographic backgrounds, which are gender, race, marital status, educational level, employment status, nature of work, as well as clinical and health characteristics (disease-related variables). As for the physical element, the Functional Appreciation Scale and International Physical Activity Questionnaire will be used, while for the psychological element, the Acceptance of Illness Scale and Self-Esteem Scale will be employed. Additionally, the motivation and dedication to work will be assessed using the Utretch Work Engagement Scale – 9 (UWES-9) and Work-related Quality of Life Scale. These questionnaires have been used widely in many studies on populations with chronic illnesses. Table I summarizes the key variables and the measuring instruments.

Table I: Key variables and research instruments.

Key Variables	Measuring Instruments
1. Resilience	Brief Resilience Scale
2. Personal characteristics:	
a. Demographic profile: Gender, race, marital status, educational level, employment status, etc.	Sociodemographic questionnaire
b. Health status	Clinicodemographic questionnaire
3. Physical factor	Functional Appreciation Scale and International Physical Activity Questionnaire
4. Psychological factor	Acceptance of Illness Scale and Self-Esteem Scale
5. Working motivation factor	Utretch Work Engagement Scale – 9 (UWES-9) and Work-related Quality of Life Scale.

Data Analysis

Data obtained in Phase I will be analysed using the Statistical Package for the Social Sciences (SPSS) software. Descriptive statistics will be employed to describe the personal, physical, and psychological data. Inferential statistics, using regression analysis, will be performed to determine the variables associated with resilience and RTW. The assumptions of the chosen

statistical tests will be examined before conducting the statistical analysis. A p-value of less than 0.05 will be used to indicate the statistical significance.

Phase II – Qualitative Study Design

The objectives of Phase II are to understand how chronic illnesses influence the level of resilience and to identify the factors that can enhance resilience to RTW in individuals with chronic illnesses. Therefore, face-to-face focus group discussions (FGDs) will be employed to obtain deep insights on the topics as the nature of FGDs are generally less intimidating than a one-on-one interview. Findings obtained in Phase I will provide foundational insights about resilience and RTW and allow the researcher to identify important areas for further exploration which will then enable the researcher to develop the interview questions.

Study Population and Participants Recruitment

The study population of this phase will be among low- and middle-income individuals with chronic illnesses. However, participants in this phase will be enrolled through purposive sampling, whereby a list of potential participants will be obtained from the initial phase of this study. This recruitment approach enables the researcher to recruit a number of participants with similar characteristics, so that interaction among participants will be synergistic and comprehensive (19,20). The potential participants will be identified from the list and be contacted through telephone for screening.

The participants will be screened based on predetermined criteria, which include adults aged 20 to 55 years old, having been diagnosed by a physician with any chronic illnesses such as, but not limited to, heart disease, kidney failure, diabetes, and chronic musculoskeletal disorders for at least three years, having the intention to remain in the workforce or having experience of RTW, and being able to communicate either in Malay or English language. However, those with no working experience but who intend to work will not be selected. To obtain a broader range of perspectives, this study will include participants with varying levels of resilience which will be determined through BRS scores.

The sample size of participants in this phase will be based on the literature's recommendation, whereby a minimum of three sessions of FGDs with three to twelve participants per session will be adequate to reach the data saturation point with the most prevalent themes (21). Having more than twelve participants per session may cause difficulty for each participant to express their views thoroughly as the ideal duration of each FGD should not exceed one and a half hours. On the other hand, having fewer than three participants might not be sufficient to generate comprehensive discussions among the group members (22). Based on this recommendation, 40 participants will be invited to participate in the FGDs, and they will be equally divided into four groups. The FGDs will primarily be conducted in Malay language, the national language of Malaysia.

Data Collection and Data Analysis

Semi-structured interviews and open-ended questions will be used during the FGDs. The topic guide and the interview questions will be formulated based on the findings obtained in Phase I as well as through an extensive review of published literature on resilience and RTW. The preliminary draft of interview guide and interview questions will undergo a preliminary review by the research team members. Any necessary improvements to the interview questions will be made accordingly. The procedure for conducting FGDs will be based on a specific approach outlined in a previous study (23).

A mock FGD will be conducted prior to the actual FGD, with the aims to experiment the flow of the FGD, to verify the comprehensibility of the interview questions, and to enhance the researcher's skills as a moderator. At least three undergraduate students from health sciences background will be requested to play the role of adults with chronic illnesses in the mock FGD, and one student will act as the field note-taker and timekeeper. The mock FGD will be recorded using a voice recorder; however, the discussion will not be transcribed and analysed.

For the actual FGDs, arrangements will be made with the participants through phone calls. They will be informed about the purpose and scope of the session. To optimise attendance at the FGDs, participants will be reminded individually a day before the session. The FGDs will be held in a private room to ensure participants' comfort throughout the session. Each participant's preferred short name will be used to maintain their privacy. The FGDs will begin with a short introductory session about the study's topic, followed by a series of questions. Probing questions will be prepared to facilitate participants in elaborating further about a particular issue. Each session will last approximately one hour and will be recorded using a voice recorder.

The recordings will be transcribed by the researcher, and the transcripts will be reviewed accordingly before proceeding with the data analysis procedure. A thematic analysis approach will be performed using the Nvivo software. The analysis procedure will be guided by a specific established framework as outlined in a previous study (24). There will be six steps, which are: 1) familiarisation with the transcript to gain an in-depth understanding on the interview statements; 2) initial code extraction; 3) theme search; 4) theme review; 5) theme definition; and 6) report production.

Trustworthiness of Qualitative Study

The trustworthiness of the qualitative study will be achieved through three main approaches: credibility (internal validity), transferability (external validity), and

dependability (reliability) (25). The credibility of the study will be attained through three types of triangulation, which are theoretical triangulation, methodological triangulation, and investigator triangulation. In the theoretical triangulation, different theoretical concepts will be applied when developing the themes from the qualitative data. As for methodological triangulation, member checking or also known as respondent validation will be employed, whereby the transcripts will be reviewed by the participants to prevent misinterpretation of the responses. Finally, for the investigator triangulation, multiple researchers will be involved in the data analysis procedure (25,26).

Transferability refers to the applicability of the findings to be extrapolated. This will be achieved by providing detailed information about the study, allowing readers to determine if the findings are applicable to other contexts. As for dependability, which is defined as the ability of the study to be replicated by future studies, it will be achieved by providing details of the study's protocol, including the research site, participant recruitment process, data collection flow, as well as data management and analysis (25,26).

Ethical Consideration

Ethical approval to conduct the study has been obtained from the International Islamic University Malaysia Ethics Committee (IREC 2024-318). Permission to access patient databases will be sought from the relevant authorities. Informed consent will be obtained from each participant prior to conducting the survey and interviews. All data obtained in Phase I and Phase II will be stored securely and will be accessible only to the authorised personnel.

DISCUSSION

As the dimension of resilience contains various complex elements (27), understanding the resilience factors related to RTW requires detailed exploration. Hence, this study will apply a mixed-methods protocol as the approach enables the researcher to address diverse enquiries about the study's topic (28). To enhance the methodological rigour, this study is underpinned by several established frameworks. Choosing a pertinent framework in a research study is fundamental as it provides a step-by-step strategy when conducting the research. Even though the study protocol has been approved by the institution's ethics committee, any important changes, if necessary, can still be made, provided that these changes must be reported immediately to the ethics committee before implementation.

There is an urgency to facilitate workforce retention among individuals with chronic illnesses (29). Hence, it is crucial to understand the resilience of individuals affected by these chronic illnesses as well as the contributing factors of resilience to RTW. As the prevalence of chronic illness in Malaysia is increasing and the impacts of chronic illnesses on employment are pronounced (30), the need to carry out this study is critical, and it needs to be expedited. The government, relevant bodies, and policymakers may require comprehensive data that are helpful in informing strategic initiatives to support this population. Furthermore, insufficient information about resilience may hinder the advancement of initiatives or policies to support individuals with chronic illnesses in returning to work resiliently.

This study also has the potential to strengthen the role of the healthcare system in supporting the recovery and integration of individuals with chronic illnesses into the workforce. Considering that this population faces a long-term burden of the illness, data derived from this study may be able to recommend appropriate changes to current approaches, including improvements in rehabilitation programmes and psychological support that are tailored to the population's needs. As for future researchers, the mixed-methods protocol outlined in the study is reproducible. The protocol can be adopted or adapted in any studies employing a mixed-methods approach. The data obtained in this study can also be used as a comparison data in future studies. Moreover, the scope of this study can be expanded if more robust data are required.

This study, however, is subject to several limitations. The quantitative study will employ several sets of survey questionnaires, which may lead to participant fatigue and be overwhelming. To reduce the potential of disengagement, participants will be given the flexibility to complete the survey at their own pace, without any time constraints. Additionally, the qualitative data in this study will be obtained through group discussions, which may cause difficulties for participants in spontaneously expressing their opinions due to fear of disagreement. Nevertheless, this issue can be minimised by emphasising the importance of openness and mutual respect for each other's opinions. Despite these limitations, the methodological approach of this study follows established best practices, and the findings of this study will contribute to a growing evidence on resilience in the RTW context.

ACKNOWLEDGEMENT

The authors would like to thank to the institution ethical committee for permission to conduct this study. This study is supported by the Ministry of Higher Education through Fundamental Research Grant Scheme 2024 (Ref: FRGS/1/2024/SS10/UIAM/02/1), and will be undertaken as a part of MSc study at the Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, Kuantan Pahang.

REFERENCES

1. Hacker K. The burden of chronic disease. Mayo

Clinic Proceedings: Innovations, Quality & Outcomes. 2024;8(1):112-9. doi:10.1016/j.mayocpiqo.2023.08.005.
2. Maraş G, Sьrme Y. Multimodal Treatment Approaches to Chronic Diseases. Exploratory Research and Hypothesis in Medicine. 2022;7(2):95-101. doi:10.14218/ERHM.2021.00079.
3. Hu Y, Yang Y, Gao Y, Zhao L, Chen L, Sui W, Hu J. The impact of chronic diseases on the health-related quality of life of middle-aged and older adults: The role of physical activity and degree of digitization. BMC Public Health. 2024;24(1):2335. doi:10.1186/s12889-024-19833-8.
4. Roohafza H, Feizi A, Tirani SA, Rabiei K, Bahonar A, Alikhasi H, Sarrafzadegan N. Epidemiological survey of chronic diseases on manufacturing employees (ESCOME): Design and methodology of a large cross-sectional study. Clinical Epidemiology and Global Health. 2020;8(1):275-9. doi:10.1016/j.cegh.2019.08.012.
5. Awaluddin SM, Kuay LK, Shawaluddin NS, Tuan Lah TMA, Muhamad Robat R, Mahjom M, Mohd Yussof MF. The prevalence of cardiovascular disease risks among working people Malaysia: findings from the National Health and Morbidity Survey 2015. Journal of Clinical and Health Sciences. 2023; 8(2):22-34. doi:10.24191/jchs.v8i2.19191.
6. Bakar AS, Rahman HA, Shahar HK, Nazan AI, Idris K. Chronic Disease Management Behaviours among Malaysian Low-Income Workers: A Descriptive Study. Asian Journal of Medicine and Biomedicine. 2022;6(1):101-3. doi:10.37231/ajmb.2022.6.S1.545.
7. Bosma AR, Boot CR, Schaafsma FG, Anema JR. Facilitators, barriers and support needs for staying at work with a chronic condition: a focus group study. BMC Public Health. 2020;20:1-1. doi:10.1186/s12889-020-8320-x.
8. Kwon SH, Myong JP, Kim HA, Kim KY. Association between morbidity of non-communicable disease and employment status: a comparison between Korea and the United States. BMC Public Health. 2020;20:1-1. doi: 10.1186/s12889-020-08883-3.
9. Kazibwe J, Tran PB, Annerstedt KS. The household financial burden of non-communicable diseases in low-and middle-income countries: a systematic review. Health research policy and systems. 2021;19(1):96. doi:10.1186/s12961-021-00732-y.
10. Ye ZJ. Resilience in chronic disease. Frontiers in Psychiatry. 2022;13:846370. doi:10.3389/fpsyt.2022.846370.
11. Gheshlagh RG, Sayehmiri K, Ebadi A, Dalvandi A, Dalvand S, Tabrizi KN. Resilience of patients with chronic physical diseases: A systematic review and meta-analysis. Iranian Red Crescent Medical Journal. 2016;18(7). doi:10.5812/ircmj.38562.
12. Масна P, Barranco M, Gorbeca S, Iraurgi I. Expression of resilience, coping and quality of life in people with cancer. PloS one. 2020;15(7):e0236572. doi:10.1371/journal.pone.0236572.
13. Young AE, Roessler RT, Wasiak R, McPherson KM, Van Poppel MN, & Anema J. A developmental conceptualization of return to work. Journal of occupational rehabilitation. 2005;15,557-568. doi:10.1007/s10926-005-8034-z.
14. Oates GR, Jackson BE, Partridge EE, Singh KP, Fouad MN, Bae S. Sociodemographic patterns of chronic disease: how the mid-south region compares to the rest of the country. American journal of preventive medicine. 2017;52(1):31-39. doi:10.1016/j.amepre.2016.09.004.
15. Harris H, Ooi YB, Lee JS, Matanjun P. Non-communicable diseases among low income adults in rural coastal communities in Eastern Sabah, Malaysia. BMC Public Health. 2019; 19, 1-13. doi:10.1186/s12889-019-6854-6.
16. Su TT, Azzani M, Adewale AP, Thangiah N, Zainol R, Majid H. Physical activity and health-related quality of life among low-income adults in metropolitan Kuala Lumpur. Journal of epidemiology. 2019;29(2):43-9. doi:10.2188/jea.JE20170183.
17. Skamagki G, King A, Carpenter C, Wehlin C. The concept of integration in mixed methods research: a step-by-step guide using an example study in physiotherapy. Physiotherapy Theory and Practice. 2024;40(2):197-204. doi:10.1080/09593985.2022.2120375.
18. Ahmad Sabki Z, Kim LH, Danaee M, Sulaiman AH, Razali KA, Koh OH, Kanagasundram S, Kaur M, Azhar FL, Francis B. Assessment of Psychometric properties of the malay version of the brief resilience scale (BRS-M) among non-academic staff working from home during COVID-19 in Malaysia. In Healthcare. 2023;11(8):1146. doi:10.3390/healthcare11081146
19. Etikan I, Bala K. Sampling and sampling methods. Biometrics & Biostatistics International Journal. 2017;5(6):00149. doi:10.15406/bbij.2017.05.00149.
20. Palinkas LA, Horwitz SM, Green CA, Wisdom JP, Duan N, Hoagwood K. Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. Administration and policy in mental health and mental health services research. 2015;42:533-44. doi:10.1007/s10488-013-0528-y.
21. Guest G, Namey E, McKenna K. How many focus groups are enough? Building an evidence base for nonprobability sample sizes. Field methods. 2017;29(1):3-22. doi:10.1177/1525822X16639015.
22. Dilshad RM, Latif MI. Focus group interview as a tool for qualitative research: An analysis. Pakistan Journal of Social Sciences. 2013 Jun 30;33(1):191-8. Available from: https://pjss.bzu.edu.pk/index.

php/pjss/article/view/189
23. Kamsan SS, Singh DK, Tan MP, Kumar S. The knowledge and self-management educational needs of older adults with knee osteoarthritis: A qualitative study. PLoS One. 2020;15(3):e0230318. doi:10.1371/journal.pone.0230318.
24. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative research in psychology. 2006;3(2):77-101. doi:10.1191/1478088706qp063oa.
25. Haq ZU, Rasheed R, Rashid A, Akhter S. Criteria for assessing and ensuring the trustworthiness in qualitative research. International Journal of Business Reflections. 2023;4(2). doi:10.56249/ijbr.03.01.44.
26. Stahl NA, King JR. Expanding approaches for research: Understanding and using trustworthiness in qualitative research. Journal of developmental education. 2020;44(1):26-8. Available from: http://www.jstor.org/stable/45381095
27. Fraccascia L, Giannoccaro I, Albino V. Resilience of complex systems: State of the art and directions for future research. Complexity. 2018;2018(1):3421529. doi:10.1155/2018/3421529.
28. Dawadi S, Shrestha S, Giri RA. Mixed-methods research: A discussion on its types, challenges, and criticisms. Journal of Practical Studies in Education. 2021;2(2):25-36. doi:10.46809/jpse.v2i2.20.
29. Bosma AR, Boot CR, Snippen NC, Schaafsma FG, Anema JR. Supporting employees with chronic conditions to stay at work: perspectives of occupational health professionals and organizational representatives. BMC Public Health. 2021;21:1-3. doi:10.1186/s12889-021-10633-y.
30. Khaw WF, Chan YM, Nasaruddin NH, Alias N, Tan L, Ganapathy SS. Malaysian burden of disease: years of life lost due to premature deaths. BMC Public Health. 2023;23(1):1383. doi:10.1186/s12889-023-16309-z.