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Article

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Development and validation of a digital community-based mental health protocol (RELATE-ME) in Malaysia

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Abstract

To bridge the gaps of mental health service in Malaysia, we developed a digital intervention protocol (RELATE-ME) aiming to restore social connectedness and well-being during the COVID-19 pandemic lockdown. Co-designed with a cross-disciplinary panel, we integrate principles of digital mental health, support group modality, psychoeducation elements, and community engagement into a 2-week online group program. To validate the protocol, we trained three community health workers (CHWs) to facilitate a briefer version of RELATE-ME with two groups of participants (six elders and six youths) in suburban Malaysia. After 4 days, they were interviewed regarding the feasibility and acceptability of this program. The interview transcripts were coded by the research assistant through an inductive-deductive method. Results showed that the majority of the participants reported the relationship with CHWs and peers as a motivator to sustain their engagement and it took time to build trust with each other. They appreciated the engaging group contents (e.g. relaxing and pleasant activities), sharing of their peers and skill-building lessons (e.g. learning of goal setting, stress management and relationship building). However, they faced the challenge of time constraints, family duties, low English literacy and digital literacy, especially among the elderly group. This finding suggested that RELATE-ME is a feasible protocol to increase social connectedness and well-being in the suburban area of a middle-income Asian country like Malaysia. Its effectiveness could be further enhanced through capacity building of CHWs, translating all contents into local languages and implementation in a physical setting.

Keywords: digital mental health, community engagement, COVID-19 pandemic, community health workers, RELATE-ME protocol, qualitative action research

Contribution to Health Promotion

- A new digital mental health protocol (RELATE-ME) was designed by experts to improve social relationship and self-management skills.
- This protocol was found to be helpful to bridge social connectedness and well-being in a semi-urban setting during the pandemic lockdown.
- This protocol could be used online and offline for low- and middle-income countries to improve at low cost.
- This protocol relies on the local community health workers to reduce mental health stigma and increase access to health services.
- This protocol could be translated into different languages and adapted to different lengths based on the situations.

BACKGROUND

Pandemics have often durably affected the structure of societies and how people relate to others, and it is now widely accepted that the same phenomenon is underway during the current COVID-19 crisis. Public health measures such as lockdown, travel ban and social distancing were implemented globally to reduce the spread of COVID-19. However, such measures, that greatly reduce human interactions, have resulted in social isolations (Palgi *et al*., 2020), which can impact mental health as depicted by the evolutionary theory of loneliness (Cacioppo and Cacioppo, 2018). Many recent studies have examined the effect of the COVID-19 pandemic on mental health and the

need for social connectedness (Šakan Šakan *et al*., 2020; Ting *et al*., 2021). Among the most pervasive potential effects of this pandemic is its impact on mental health across the globe (Kola *et al*., 2021; Kumar and Nayar, 2021; O'Connor *et al*., 2021). Individuals who are especially vulnerable to mental health issues during the COVID-19 pandemic include women, the elderly and individuals with poor economic status (Machado *et al*., 2020). Disruption of relationships and social connections during a long-term pandemic is worrisome, especially for these vulnerable populations. To improve social connections, having support groups that are culturally specific with activities attuned to their particular stages of life will also be an important avenue to reinforce trusting relationships and social integration. However, there are limited studies on community-based intervention to improve mental health among vulnerable groups during the COVID-19 pandemic, by using relational community engagement perspectives (Tan *et al*., 2021).

Therefore, community engagement with a focus on mental wellbeing is on dire need, especially in the Asian context, where help-seeking behaviour is largely strong-ties based (Ting and Sundararajan, 2018; Ting *et al*., 2021). It was found that in Malaysia, people would seek help from 'cultural insiders' (strong-ties network) rather than a 'professional outsider' (weak-ties network) during the pandemic, due to accessibility and professional stigma during the COVID-19 pandemic (Zay Hta *et al*., 2024a). The public stigma towards COVID-19 patients is also higher among those who adopt an 'authoritarian' mentality, which hinders them to seek mental health professionals (Ting *et al*., 2023; Zay Hta *et al*., 2024b). Therefore, a more relational approach in the community engagement is more culturally appropriate and safe for the Malaysian rural populations.

In view of the gap in current health delivery service, we developed a relational community engagement (RELATE-ME) program to boost the social connectedness and well-being of a suburban community during the COVID-19 pandemic outbreak in Malaysia. An integral part of RELATE-ME protocol is the employment and implementation of community health workers (CHWs) who are the 'cultural insider' that belongs to the existing neighbourhood as the 'familiar others' (strong-ties relationship), in comparison to other mental health interventions that are built on weak-ties (professional strangers) network. CHW is supposed to reduce the stigma of help-seeking among suburban dwellers, which also serves as a bridge to the referral system by identifying higher-risk individuals and motivating them to seek specialized help if needed. This type of community engagement and empowerment has been demonstrated to be an essential cornerstone in policy implementation to contain health emergencies successfully (Kickbusch and Reddy, 2016; Al Siyabi *et al*., 2021). However, during the COVID-19 pandemic lockdown phase, such an engagement would need a creative and innovative approach for the stakeholders to stay connected in daily life; this is why we opt for a digital platform (an existing social media app) to build a hybrid RELATE-ME protocol that is convenient, familiar and accessible the suburban community.

Strengths of digital health

The initial vision for digital health, which is to reshape primary health care and effective public health action, has been given a massive impetus by the COVID-19 pandemic. Many countries have quickly deployed digital technologies to facilitate flattening the curve of the COVID-19 infection, clinical management and public health interventions (Golinelli *et al*., 2020; Whitelaw *et al*., 2020; Alghamdi and Alghamdi, 2022). Digital health has been a promising vehicle to address social and health service disruption and mental health wellbeing during the pandemic. The evidence synthesis also proved that most mental health interventions designed during the pandemic employed digital technologies (Li, 2023).

Over the past decade, information and communication technologies have been distributed swiftly on a global scale. Southeast Asia and the Oceania region have been estimated to have almost 850 million smartphone subscriptions in 2021 (Ericsson Mobility Report: Southeast Asia and Oceania November 2015, 2015). Digital health is a promising vehicle to address social and health service disruption and mental health wellbeing during the pandemic. However, it may also evoke emerging issues in access and application of digital technology among people with low digital literacy and worsen the existing socio-economic inequality in some particular groups of the population. Therefore, our study chose a user-friendly digital platform (*WhatsApp*) that is free of download and already widely adopted by Malaysians for daily communications within a closed-knit network, even for those who have low digital literacy in the suburban area.

Research aim

The goal of this study is to develop and validate RELATE-ME protocol, a community-based mental health-informed digital platform that serves as a channel to boost social connectedness, specifically in a semi-rural community of a developing country like Malaysia. We employed an action-based qualitative research method, by co-designing the protocol with the stakeholders in the community. By addressing the stigma of mental health and strong-tie community network in a Southeast Asian country like Malaysia, the RELATE-ME protocol would be implemented by Community Health Workers (CHWs) who are also local dwellers, but with further training in digital intervention. They would be serving as the 'bridge' between the research team and the person-in-need, due to their pre-existing relationship with the community dwellers. By employing and mobilizing CHWs from multi-cultural and multilingual backgrounds, we aimed to increase the cultural responsiveness of the protocol to increase trust-building and overcome communication barriers in the community engagement process.

METHODS

Study site: the Southeast Asia Community Observatory (SEACO) at Segamat, Johor

This study was conducted in the Southeast Asia Community Observatory (SEACO), a health and demographic surveillance site (HDSS) established in 2011 and managed by Monash University Malaysia, in partnership with Monash University Australia and the Jeffrey Cheah School of Medicine and Health Sciences. The SEACO is located in Segamat, the northernmost district in the southern peninsular state of Johor, Malaysia, and operates in five of the 11 semi-rural and rural sub-districts: (i) Sungai Segamat; (ii) Chaah; (iii) Bekok; (iv) Gemereh and (v) Jabi. This surveillance site covers approximately 1250 $km^{2,}$ which covers ~13,000 households and ~40,000 individuals (Partap *et al*., 2017).

According to the 2017 census, the SEACO community dwellers predominantly comprise individuals of ethnic Malay, Chinese and Indian descent, with a small number of Malaysian

aboriginals (*Orang Asli*). Fifty-eight per cent of the community are employed, 24% are housewives, 12% are unemployed and 5% are students, while the remaining are pensioners. In terms of economy, almost 30% engaged in agriculture (oil palm, rubber, fruit plantations), forestry and fisheries; 12% were in groceries and car repair services; 11% were in the hotel and beverage industry; while the remainder were in the manufacturing, factory and education industries (SEACO, 2017).

The SEACO operates successful community engagement strategies, which include regular community consultation meetings. Five community engagement committees (CEC) were formed with government officials, heads of villages and key resource persons from the community to facilitate community consultation and participation, information exchange and direct involvement in research and activities (Allotey *et al*., 2014). In addition, the SEACO collaborates with relevant local non-governmental organizations, social clubs and religious groups. These relationships facilitate engagement with and acceptance of research projects.

Participants over 18 years of age residing in the five subdistricts wherein the SEACO operates were eligible for this study.

Ethics approval

The study was approved by the Monash University Human Research Ethics Committee (MUHREC) (approval numbers: 25807 and 27445), and the World Health Organization: Western Pacific Region Office (WHO: WPRO) (approval number: 2021.1.MAA.1.MHI).

Development of RELATE-ME protocol

The co-design approach (Balcaitis, 2019) was adapted to guide the RELATE-ME protocol development process. For community engagement programs to be successful, a wide range of key community leaders, including those from religious, health, minority groups, NGO and government sectors, need to be involved so that in unison, they can reach out to the community effectively and engage them in a collaborative and active manner, though this process will take a considerable amount of times and effort (Gilmore *et al*., 2020). In sum, our study encompasses the following steps from January to August 2021: (1) literature review and needs assessment; (2) deep-dive sessions to prioritize the needs of local populations; (3) developing RELATE-ME protocol; (4) gathering feedback on protocol through expert panels and stakeholders' discussions and (5) conducting feasibility and acceptability test (see Figure 1 for detailed timeframe).

Step 1—literature review and needs assessment

A rapid systemic review and needs assessment were conducted in the initial phase. Based on a time-series longitudinal quantitative study over two-time points (phase 1: April–May 2020; phase 2: January–February 2021) that assessed the prevalence and determinants of mental health risks, we found that in Segamat, the populations ($N = 472$) scored highest on the 'loneliness' domain during the pandemic lockdown (18% at phase 1 and 19% at phase 2). This concurred with our rapid systematic review where social connectedness was found to be the buffer for mental well-being during pandemic in the past.

Step 2—deep-dive sessions to prioritize the needs of local populations

Based on the needs assessment, the research team conducted several brainstorming ('deep dive') sessions and relationship mapping exercises to prioritize the goals and modes of intervention. The RELATE-ME protocol was established based on two prioritized factors of intervention design, namely, contextualization and sustainability. It also has multilevel intervention from individual to community level, based on the systemic model (see Supplementary Doc S1). In addition, the protocol would focus on the challenges of relational and social disruptions by the COVID-19 restrictions and lockdown. As professional stigma towards the healthcare sector (e.g. fear of going to hospital) was prevalent during the COVID-19 pandemic, the RELATE-ME protocol also aimed to adopt a peer-support mechanism in reducing the shame of help-seeking behaviours among Segamat dwellers.

Step 3—developing RELATE-ME protocol

The final design of RELATE-ME protocol consists of a semi-structured 2-week programme that is easy to apply either in person or virtually (Figure 2a and b). Week 1 focuses on individual coping skills, whereas Week 2 focuses on relationship-building skills. It is meant to run concurrently on both individual and group chat levels, so the participants could build a relationship with the CHWs and their peers in a simultaneous manner.

Individual-level intervention

There are three components in the individual-level intervention (see Figure 2a), namely, Daily Mood Check, Homework Check and Feedback loop. The Week 1 coping skills training topics consist of the relational map (Eco-map), self-care practice, healthy and balanced lifestyle, problem-solving skills and adaptive coping strategies. Meanwhile, Week 2 relational skills training topics include assessment of personal support systems, effective communication with loved ones, conflict resolutions and healthy boundary and relationship maintenance (i.e. how to grow and keep relationships with others).

Group-level intervention

Ideally, each group contains approximately six to eight people filtered by their common characteristics (e.g. age, gender, ethnic background, language fluency), and one CHW as group moderator. The intervention consists of four components (see Figure 2b): (i) daily group video coaching, which was sent by CHWs through video recordings or links; (ii) daily 'happy hour', in which group members share the completion of their 'pleasant activities' relevant to the topic of that particular day in the group chat; (iii) a feedback loop, whereby group members could provide feedback to each other through emojis or verbal comments in the chat by the end of the day during check-out time and (iv) weekend live activities: group moderators propose a common time (1-h) for everyone to interact synchronously online or offline, as a way to foster intimacy and trust in the group. Furthermore, group safety rules (see Supplementary Doc S2) were set up to ensure privacy and respect. The rules were discussed in the group at the outset of the first session.

There are two main topics of group-level intervention, namely, self-care and meaningful relationships (see Figure 2b). During the first week, the group discusses topics regarding self-care such as sharing photos of favourite foods, recipes and animals, healthy or unhealthy coping through self-care activities, sleeping habits, healthy foods and fitness exercises. On days 6 and 7, a group live session

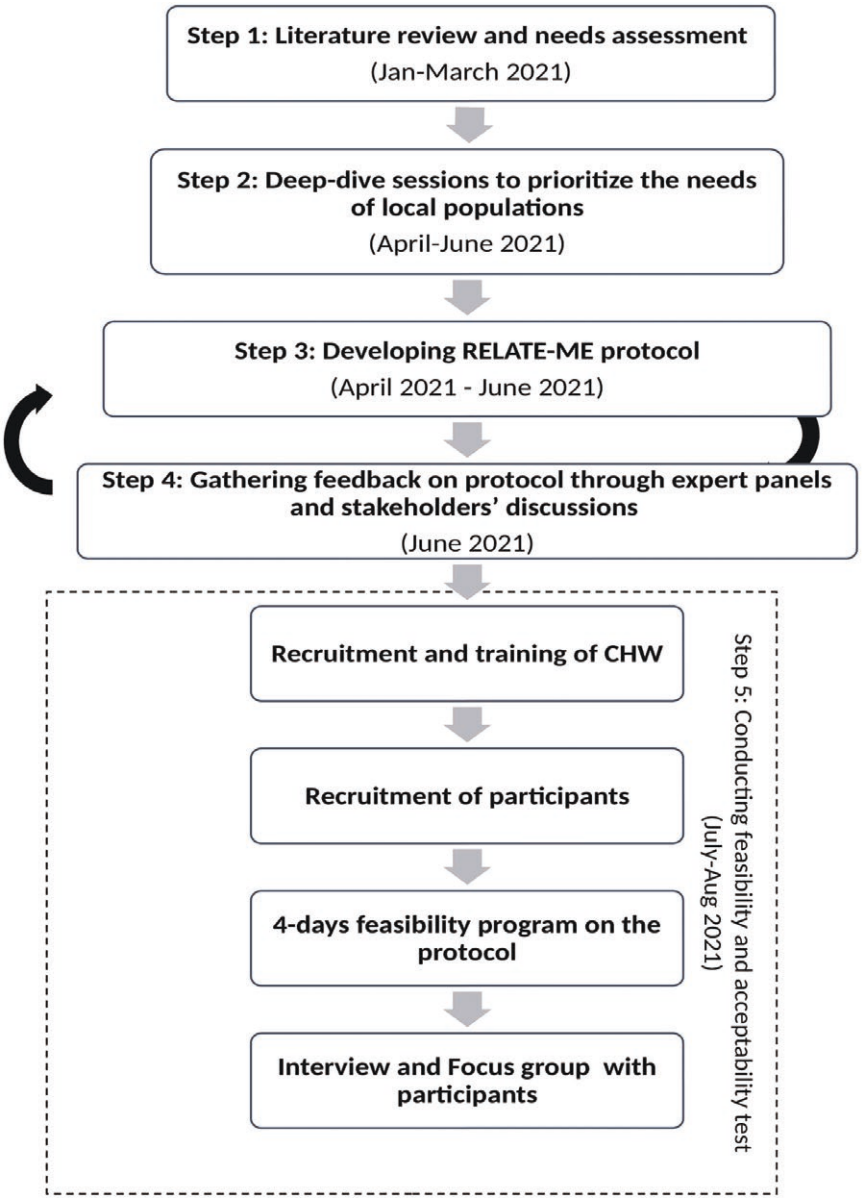


Fig. 1: Flowchart of study timeframe.

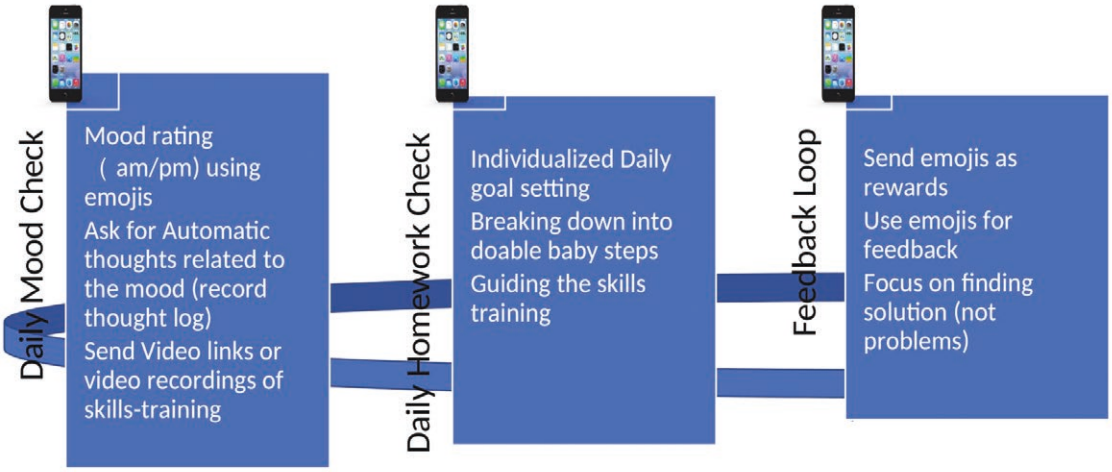
is conducted wherein everyone in the group interacts and offers feedback to the group moderator for other interesting group topics.

After the warm-up activities in Week 1, during the second week of the intervention, the group discusses more personal topics regarding meaningful relationships such as recognizing the important people in their lives, love language (i.e. how you express your love or care for others and maintaining a healthy relationship), etc. At the end of the intervention (days 6 and 7), a 1-h graduation ceremony or 'group closure' takes place in person or virtually. During this graduation ceremony, all family members are welcome to join, and each participant shares their insights and skills they have learned during the intervention and also gives feedback to the group moderators.

Step 4—gathering feedback on protocol through expert panels and stakeholders' discussions (EPSD)

As part of the participatory design of our intervention, the EPSD aimed to solicit feedback from the mental health stakeholders in Segamat through an online forum on the RELATE-ME protocol. Sixteen stakeholders consisted of three community representatives of different ethnicities (Malay, Chinese and Indian); two psychiatrists (an academician and a clinical specialist from the Segamat hospital); a family medicine specialist; a public health physician who is currently running a mental health intervention in a low-income community in Kuala Lumpur; a programme coordinator of a mental health NGO; the SEACO field manager and platform manager and the research team.

The protocol of the intervention, structure and content were presented with guidelines during a focused-group discussion (see Supplementary Doc S3). After briefing and discussion, all EPSD members appreciated the preliminary works and need assessments conducted by the research team, and agreed that this intervention/programme was timely, feasible and valuable to the community. All group members showed a willingness to support the programme and to collaborate with the research team. Some concerns



Coping Skills training Components (Week 1)	Relational Skills training Components (Week 2)
Day 1 : Draw your relational map (introducing Eco-map)-recording	Day 1: How is your support system? (e.g. assessing quality of support system)
Day2: How to practice Self-care (e.g. relaxation exercises)	Day 2: How to communicate effectively with my loved ones (e.g. active listening)
Day 3: How to keep balance Lifestyle (e.g. behavioral activation, pleasant activities)	Day 3: How to resolve conflicts with my loved ones
Day 4: How to problem-solve the barriers (e.g. solution-focused)	Day 4: How to keep healthy boundary with my loved ones
Day 5: How to cope adaptively (e.g. adaptive coping strategies)	Day 5: How to grow my relationship with others Draw your relational map
Day 6 & 7 : Homework review with the case manager (e.g. journaling activities; thought/mood log); Attend Group activity (synchronous)	Day 6 & 7: Homework review with the case manager (e.g. journaling activities; thought/mood log); Attend Group Closure ceremony

Fig. 2: (a) Structure and content of RELATE-ME prototype (individual level). (b) Structure and content of RELATE-ME prototype (group level).

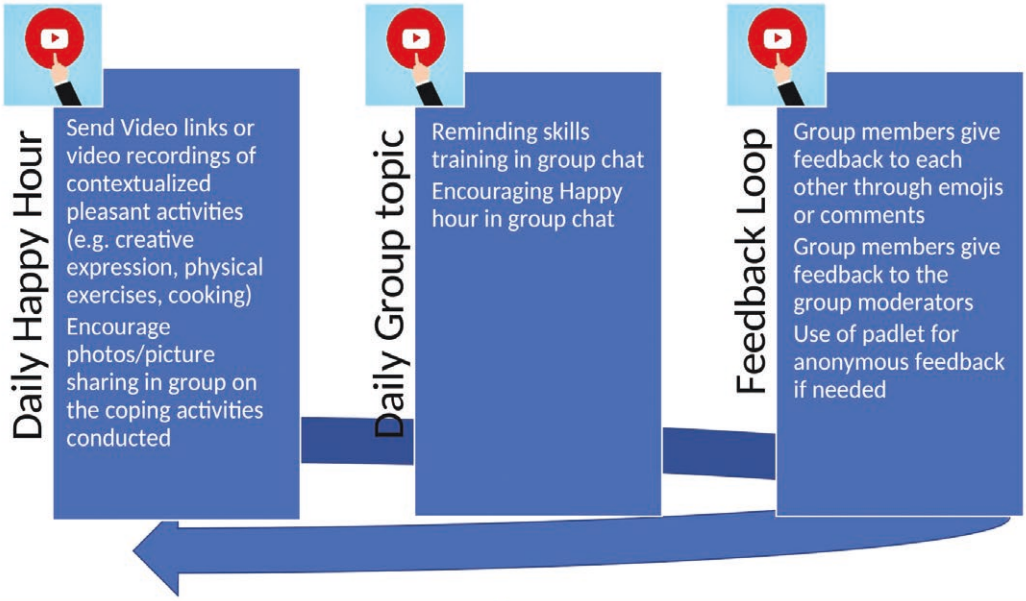
were raised regarding the capacity of the CHWs and the digital literacy of the Segamat population. Therefore, the RELATE-ME protocol was further enhanced by adding a rapid immersive training workshop for the CHWs as capacity building (see Part 1: training of CHW below) and adding a project coordinator to supervise the CHW. The activities of RELATE-ME were also fine-tuned to lower the requirement of digital fluency of the participants, by using recorded videos as teaching tools, rather than mandating live engagement over the phone.

Step 5—conducting feasibility and acceptability pilot test

In July 2021, we conducted a pilot study among common residents in Segamat to determine the feasibility of the RELATE-ME protocol. Though the original protocol was designed for a 2-week intervention, based on the feedback from the Segamat community, a 4-day intervention would be more feasible and acceptable. As aforementioned, due to the policy of social distancing during the COVID-19 lockdown, we utilized the WhatsApp platform, which did not require high-speed internet access, and is the most widely used social media app among Malaysians, including low rural residents with low digital literacy.

Part 1: recruitment and training of community health workers

Due to the cultural diversity of Segamat residents, three CHWs from three major ethnicities (Malay, Chinese and Indian) were recruited from the Segamat community by SEACO for the pilot-feasibility study. The inclusion criteria for CHWs recruitment were those who have good communication skills and knowledge in smartphone applications; and the exclusion criteria were those who were not proficient in Malay and/or English. The CHW positions were



Group topic-Self-care (Week 1)	Group topic—Meaningful Relationship (Week 2)
Day 1 : Who are you? (ice-breaking game--photos sharing of their favorite foods/recipes/animals)	Day 1: Who are the people important to you?
Day2: What are your self-care activities (15 mins talk-healthy coping vs unhealthy coping)?	Day 2: How do you express your love or care for others? (15 mins of talk-check with your VIP)
Day 3: What are your sleeping habits?	Day 3: Who are the people you would like to reconnect?
Day 4: What is your healthy food?	Day 4: What does a healthy boundary look like to you?
Day 5: What are your healthy exercises?	Day 5: What is the new relationship you build in these 2 weeks?
Day 6 & 7 : Live Forum with the healthcare frontliners to reduce stigma perception towards frontliners (1hr) Group meeting or Group live session(1hr): family members are welcome, group members sharing about the week, giving feedback to the group moderator	Day 6 & 7: Live Forum with the mental health professional team to reduce stigma perception towards mental health access (1hr) Group Closure and Graduation ceremony (1hr): family members are welcome, group members sharing about the insights and skills learned in the past 2 weeks, giving feedback to the group leaders

Fig. 2: Continued

advertised through the SEACO website, social media and personal connections. The research team selected the applicants based on their professional and communication skills, and their interest in volunteering (see Table 1 for demographics).

A 2-day live orientation and training was provided by the researcher team to the CHWs via the Zoom video conferencing platform for a total of 8 h. In addition to the three recruited CHWs, the research team also invited other SEACO staffs who were interested in mental health issues to participate in professional development and capacity building. In total, 26 participants joined the training session.

The training session aimed to improve the following skills and knowledge among the CHWs: (i) online support group facilitating; (ii) the relational aspect of digital mental health intervention; (iii) mental health promotion and (iv) coping strategies through self-care activities. The first author selected topics from the original 2-week protocol and created simulation activities for trainees to immerse through the WhatsApp group facilitation and exchanges. The majority of the participants

Table 1. Socio-demographic of the participants

ID	Age	Gender	Ethnicity	Religion	Marital status	Education
Community health workers (*n* = 3)						
CHW1	25	Female	Malay	Islam	Single	Bachelor's degree
CHW2	23	Female	Chinese	Buddhist	Single	Bachelor's degree
CHW3	28	Female	Indian	Hindu	Married	Bachelor's degree
Group 1 older participants (40–60 years old)						
OP1	49	Female	Chinese	Buddhist	Married	Diploma
OP2	51	Female	Indian	Hindu	Married	Secondary school
OP3	55	Female	Malay	Islam	Married	Secondary school
OP4	45	Male	Chinese	Buddhist	Single	Secondary school
OP5	69	Male	Indian	Hindu	Married	Secondary School
OP6	53	Male	Malay	Islam	Married	Secondary school
Group 2 younger participants (20–40 years old)						
YP1	22	Female	Chinese	Buddhist	Single	Bachelor's degree
YP2	31	Female	Indian	Hindu	Single	Diploma
YP3	29	Female	Malay	Islam	Married	Bachelor's degree
YP4	31	Male	Malay	Islam	Single	Bachelor's degree
YP5	38	Male	Indian	Islam	Single	Secondary school
YP6	23	Male	Chinese	No religion	Single	Master's degree

Note: Acronym of ID, OP = older participant, and YP = younger participant.

gave positive feedback on the capacity-building session and agreed that the training has provided them with better knowledge of self-care activities and relational aspects of digital mental health intervention, equipped them to become better online support group facilitators and provided professional development on mental health promotion.

Part 2: recruitment of community voluntary participants

Next, 12 participants (four from each of the Malay, Chinese and Indian ethnic groups), who are residents in the Segamat area were recruited through convenient sampling to the 4-day pilot-feasibility study of the RELATE-ME intervention protocol. The inclusion criteria of the participants were: (i) aged 20 and above; and (ii) were fluent with WhatsApp usage. The exclusion criteria were people who: (i) had certified physical and/or mental disabilities; (ii) could not live independently; (iii) had negative experiences with support groups before and (iv) no smartphone or internet accessibility. The participants were later divided into two age groups: group 1 (older participants, age 40–60) and group 2 (younger participants, age 20–40) (see Table 1), because we aim to build a 'peer support group', hence certain homogeneity within the cohort will help to facilitate social connectedness through shared experiences. In addition, we mixed gender and race in each group so that it is representative of Malaysia's population demographics at large. The participants were informed of the purpose of the study and their rights to voluntary participation. Their consent was obtained verbally and audio-recorded. They were also compensated with essential food items as a token of appreciation.

Part 3: protocol implementation

The structure and content of the 4-day pilot protocol were adapted from the 2-week RELATE-ME full program, based on the priorities of social connectedness and feasibility of online materials (see Table 2), such as assessing social support through the relational map, effective communication through an understanding of love language, managing stress through pleasant activities and relaxation skills. The final topics and components selected were: (i) getting to know each other and support system; (ii) self-care and healthy coping; (iii) love language and communication style and (iv) growth in a relationship. Other modules (such as keeping a balanced lifestyle, solution-focused strategy to resolve barriers, conflict resolution strategy, keeping healthy barriers) were dropped as they required more skill buildings of CHWs and scaffolding of basic interpersonal skills among the participants.

During the trial, there were two parts of intervention—individual level and group level. Personal chat over WhatsApp is only allowed for participants' direct communication with the CHW (not encouraged among group members), for the CHW to tailor personalized goals and problem-solve with the participants. Individual-level intervention focuses on homework checking, mood check and daily goal-setting between CHW and participants. CHW may also use the private chat to encourage and motivate the participants to join the group chat. Social connection with the CHW is another benefit of RELATE-ME, as CHW is a community insider who is more ready for active listening and mentoring. Meanwhile, the group-level intervention is helpful in socializing and normalizing the participants' shared experience. Sharing between group members has been found to facilitate social acceptance as long as the group dynamic is fostered in a transparent setting. Hence RELATE-ME protocol allows the participants to build a social network with the CHW and peers at the same time.

The 4-day protocol program was piloted in July–August 2021. Each CHW was responsible for the four participants they recruited and built a relationship with them through daily individual WhatsApp chat. Written informed consents were gained from the participants. The participants were informed to devote 1–2 h each day, between 9 am and 9 pm,

Table 2. Four-day pilot-feasibility study—structure and content

Day/Topic	Individual WhatsApp management	Group WhatsApp management
Day 1: Getting to know each other and support system (relationship mapping)	Group facilitator to-do list: Check-in at 9 am: How is your mood today? Use an emoji to represent your feeling. Assert confidentiality (no sharing with outsiders), identity will be disguised if used for research purposes. Share **Smart goal** teaching video. Goal setting for today: What would you like to accomplish today? Post your top 3 goals for today. Check out by 9 pm: Have you accomplish your goals? Encourage to write a reflective journal (diaries). 'Some people find it helpful to note down their days and feelings in a blog/diary, maybe can try it too'. Post-self-care meme and ask for feeling emoji.	Group facilitator to-do list: Check-in at 9 am: Tell us about yourself (post your recent funniest photo) Post group rules. Post relational-map teaching video. Ask the participants to share their **relational map** with the group. Group facilitators use self-modelling of how to draw the map and share it with the participant. Then ask questions one by one, waiting for their response: What have you learned from this map? Who are the important people in your life? Any people whom you like to connect with? How do you sustain meaningful relationships during a pandemic? Start to share about your relationship first. Respond with positive encouragement and appreciation ('that is good' 'thank you for sharing' no right or wrong answers' 'you are doing great') Encourage other members to interact and provide feedback between group members sharing. Check out by 9 pm: post sleep hygiene meme.
Day 2: Self-care and healthy coping (pleasant activities)	Group facilitator to-do list: Check-in at 9 am: How is your mood today? Use an emoji to represent your feelings. Share **coping strategies** teaching video. Coping for today: What would you like to accomplish today? Post your top 3 coping strategies for today. Check out by 9 pm: Have you used any of the coping strategies? Encourage to write a reflective journal. Post self-care meme (culturally appropriate) and ask for feeling emoji.	Group facilitator to-do list: Check-in at 9 am: Tell us about yourself (post your favourite food photo). Post happy hours YouTube links (e.g. relaxation exercises)—age-appropriate. Post **pleasurable activity list** (pdf) Ask the participant to share their 'happy hour' (picture/video) in the group. Group facilitators use self-modelling first in sharing your happy hour video. Respond with positive encouragement and appreciation. ('that is good, thank you for sharing' 'no right or wrong answers' 'you are doing great') Encourage other members to interact and provide feedback. Link the similarities between group members sharing. Check out by 9 pm: Post stress-management meme.
Day 3: Love language and communication style	Group facilitator to-do list: Check-in at 9 am: How is your mood today? Use an emoji to represent your feeling. Share **love language** video. Do a self-assessment on the **communication style** (post link). Goal setting for today: What would you like to express your love to your important others (dear ones)? Write down 3 plans to show love to your dear ones. Check out by 9 pm: Have you accomplish your goals? Encourage to write a reflective journal. Post self-care meme and ask for feeling emoji.	Group facilitator to-do list: Check-in at 9 am: tell us about yourself (post your favourite person photo). Ask the participant to share their 'love languages' in the group either in text or in picture/video. Group facilitators use self-modelling first in sharing your 'love language' in the picture. Respond with positive encouragement and appreciation. ('that is good, thank you for sharing' 'no right or wrong answers' 'you are doing great') Encourage other members to interact and provide feedback. Link the similarities between group members sharing. Check out by 9 pm: Post love languages meme.
Day 4: Growth in relationship (feedback giving)	Group facilitator to-do list: Check-in at 9 am: How is your mood today? Use an emoji to represent your feeling. Share **effective communication** video (link). Goal setting for today: Practice effective communication with your loved ones (show examples). Check out by 9 pm: Have you accomplish your goals? Encourage to write a reflective journal. Post self-care meme and ask for feeling emoji. Thank them for participation and ask for personal feedback. Tell that they will be contacted by SEACO admin for a follow-up group interview session.	Group facilitator to-do list: Arrange one hour WhatsApp **group meeting to give blessings and feedback**: Kahoot game: How much do you know about Segamat? (10 min) Ask everyone to share (40 min): What have you learned from this group about the relationship? What aspect of your relationship would you like to grow next? Who do you feel most connected with within the group? What are the messages you hope others could take away from you (things people can learn or remember about you)? The group facilitator use self-modelling first in answering the above questions. Respond with positive encouragement and appreciation. ('that is good, thank you for sharing' 'no right or wrong answers' 'you are doing great') Encourage other members to interact and provide feedback. Link the similarities between group members sharing. Give words of blessing to each participant (10 min). Check out by 9 pm: Post Segamat mental health referral list in WhatsApp group and then everyone for participation. Group leader exit by day 5 at latest.

to participate in the WhatsApp conversations and activities. The details of the activities and conversations in WhatsApp, individually and in a group, were archived by the CHWs for documentation purposes. Furthermore, to preserve confidentiality and anonymity, the participants were assigned with IDs and only demographic information were kept for reference (i.e. age, gender, ethnicity, marital status, religion, education level and household info). At the end of the study, the participants were informed of a group follow-up interview, and their verbal consent to be contacted for the interview was also obtained.

Data collection and coding

After the program, two separate online focus group discussions (FGDs) were conducted with the three CHWs and four participants from group 2 (young adults) via zoom; individual phone interviews with five participants from group 1 (older adults) were conducted as they have lower fluency of zoom meeting. The FGD and interviews were used to obtain feedback and opinions on the RELATE-ME experience (see Interview protocol for CHW and Participants in Supplementary Doc S4). The interview guide includes questions that explore the relational dimensions of CE and the feasibility and acceptability of intervention programs in a semi-rural community. The FGDs took approximately 60–100 min per session. All FGDs were conducted in English except individual phone interviews with group 1, which were conducted in Malay. The second author (H.S.Z.) conducted all FGDs and interviews, assisted by the third author (C.W.A.). All interviews were audio-recorded and subsequently transcribed verbatim.

Textual data were coded using a consensus qualitative analysis approach (Hill *et al*., 1997) in Excel file based on the interview guide. Transcripts were anonymized and then read and re-read. Data corresponding to the relational dimensions and the feasibility and acceptability of the intervention program were highlighted. The second author (H.S.Z.) conducted the initial coding, which was reviewed and discussed by the first (R.T.) and last authors (T.T.S.), until a consensus was reached.

RESULTS

We evaluated the acceptability and feasibility of the RELATE-ME protocol in the following four domains (see Supplementary Doc S5 for Thematic Analysis Result): (i) Evaluation on relational dimensions; (ii) Evaluation of structure and content of the program; (iii) Evaluation of suitability, feasibility, and sustainability; (iv) Suggestions for improvement. Themes were derived from both FDG transcripts as well as interview transcripts.

Domain 1: evaluation on relational dimensions

Theme 1: momentum in the group communication and interaction

According to the feedback of CHWs, there were differences in the dynamics of the relationship among the participants between the older (group 1) and younger participants (group 2). The older participants felt too shy to interact in the group chat and were worried that they might embarrass themselves in the group. A Chinese participant also mentioned that according to Chinese culture, people are not supposed to express their feelings openly; hence, he found it difficult to complete some of the tasks where he needed to share his feelings with others. However, the older participants were happy when others shared photos of their favourite foods and activities, especially when they discovered that they had similar interests. The older participants were also happy to meet other participants during the closing ceremony.

In contrast, the younger participants felt awkward at the beginning of the programme, as there was not a proper introduction given to one another. However, they managed to break the ice and interacted well within the WhatsApp group. As they began to share their favourite activities and pictures, they started to get to know each other better and were more open to talking, especially when they realized they had mutual interests.

The Malay participants mentioned that the use of formal English made them feel awkward to communicate with Malay CHWs at the beginning of the program—'… *but when we have to text formally, so, it's awkward but it's okay because it's in a program so, I don't mind. So, I'm okay with that. I think it's the same like in the WhatsApp group also*' [YP3]. They preferred to communicate in their mother tongue informally and in a more relaxed manner. The formal communication in the WhatsApp group chat and the use of English made the interactions feel unnatural at the beginning. Hence the CHW switched their language of communication to fit into the needs of their participants.

The participants from both age groups appreciate the support from CHW through WhatsApp personal chat as the group chat could be awkward at the beginning. As most of the older participants were married with families (except one), their time of engagement in the WhatsApp group is limited, and the need for social connectedness is less than the participants who are single, based on our observation. Most of the younger participants however had no difficulty in completing the tasks given and would respond whenever they were available.

Theme 2: group relationships helps to increase engagement and motivation

Despite a slow build-up to group cohesion, both groups of participants found the sharing and disclosure of their peers enlightening and motivating:

> … *I can say okay, good because when we start to share like pictures of food or work, favourite person, I think, so, I think they kind of like... Sometimes they respond to your post but sometimes they don't. So, it depends on each other's interests or like time, if they have free time, they can reply, response, like if they have like some similar interest like they like that food, so, like "oh I like that food too.* [YP4]

> … *the cooperation in the group is quite good because for example, when some of... The person in the group shares their relational map, so, they also give the idea how to create mine, so, it helps me.* [YP3]

> … *in WhatsApp (group chat), I saw many… one person sent this, another person sent this, others sent that. One person sent fruits and many things.* [OP5]

The participants expressed feeling motivated to engage when others shared their completed tasks in the group chat, and they could seek help from the CHWs and family members in completing their tasks.

> *… my motivation is I have a problem I asked CHW2 how to do this like relational-map, I also, first thing, I don't know how to do the map, and I asked CHW2 'what's the group task about?'. Then she will help me and so I can complete it....* [YP1]

> *… the one I don't understand, I will ask my children or grandchildren what this means, they will explain to me… then I will reply….* [OP3]

In reflection, the CHWs also emphasized that building more trust with the participants could increase their willingness to participate in the program.

Domain 2: evaluation of structure and content

Theme 1: appreciated contents

Both group of participants appreciated contents that were bringing positive emotion, raising mental health awareness and building their fluency in goal setting, stress management and relational building. Many talked about the daily homework task/topic shared by the CHW:

> *… when we do the individual chat, like me with CHW1, I like that she everyday asked about my emojis and feelings and then goals... And then everyday like 3 goals, 3 ways to coping with stress and then like that... It's suddenly kind of like …you have to set your goals daily, at least one or three daily.* [YP4]

> *…every time when somebody is asking what your goal for each day is and what you did, it's like something "oh… every day I have to set my own setting to finish every task". I did that before. But I never did it in the proper way. So, I find out this is a proper way.* [YP2]

> *… activity… like the plants and flowers… sharing pictures….* [OP2]

> *… But this program is good, I can learn a lot…because this program reminds me of my ambition, who are my favourite persons… because of my age now, I don't have time to think too much about all these... so, this is good, teaches us what you like, what kind of food you like….* [OP1]

Participants from the younger group reported that 'love language' and 'relational map' exercises helped them get to know more of themselves and their significant others.

> *… I like the love language. That one is quite interesting. You know... I think about how you interact with your family, how you interact with your friends, something like… in the society, you know... For me, that one is very unique, I find out that my love language, because I'm kind of the reserved type of person, so I didn't talk much to others....* [YP2]

> *… the task given is quite interesting because sometimes we learn a new thing like the relational map. And then from this task told me how we're going to do, how we're going to appreciate ourselves, how we're going to appreciate the person that we love, and how to identify the relationship with others, with the things that we commit....* [YP3]

Younger participants reported that they liked the topic of mental health as it helped to cope with the stress of working from home during the pandemic lockdown.

> *… I think the strength is on the topic itself. Yeah, because it is related to our lives but some of us cannot see it until we experience it. So, I think the topic itself is the strength of the project.* [YP4]

> *… And the first day I joined the program, I find out there something is a unique, you know, because it just helps for my health. Because currently the situation is very tough for me, because of working and working from home some more is very pressure, so that mean it kind of helping me....* [YP2]

Theme 2: challenging structure

Some younger participants found the video and materials provided in the pilot trial difficult to understand, not engaging and hard to follow.

> *… Sometimes the video talked about how we're going to do the task. I think the video provided is quite boring because…I think the video is too academic like in lecture....* [YP3]

Some older participants also reported that original English materials in this program made it difficult to understand and complete the tasks given.

> *… the English, I don't understand….* [OP3]

> *… because my English is not good, just enough… if more, I'm not good, I have to find many words in the dictionary then I will understand English….* [OP1]

A few older adults also reported challenges in digital fluency in navigating through online platform,

> *… I think nowadays many people do not know how to answer, using phones etc… many people don't know how… If (they) don't know how then that will be difficult (for them). For people aged 50 years or 40 years and above, I think it will be difficult... Except for those who know a lot about computers or handphones... Even myself, I used to not know how to answer. Just recently during MCO until now, I know how to answer. How to use a handphone, how to use a computer....* [OP1]

Domain 3: evaluation of acceptability and feasibility

Theme 1: barriers

When being asked about the feasibility of the full RELATE-ME program (2 weeks), the first perceived barrier reported by

the participants was time constraints, as the activities were time-consuming and committing to the program for 2 weeks was found to be burdensome.

> *… for this program to run for 2 weeks, I think it has a problem because the program is for 14 days, I think it's too long. We need to focus all this time from 9 am to 9 pm, 'oh today I have goal need to complete, I have stress at there'. So, I think I cannot relax for the 14 days....* [YP1]

> *… 14 days is too many days, too long… two days, okay. 14 days, many days… half a month….* [OP1]

The second perceived barrier is monolingual materials adopted in the presentation of RELATE-ME, as Malaysia is a multilingual country. Even younger participants opined that the use of English as the only medium of the program is not feasible because most of the Segamat residents preferred to speak the local dialects, and not many of them were fluent in English.

> *… not everybody can speak English, not everybody can understand English very well, so, in future much better if have dual language, for both people can connect each other, so, I think the major problem is the language, you know... For Segamat... I'm not looking down on them, but it's just majority go for Malay....* [YP2]

The older participants mentioned that it would be challenging for them to catch up with the 2-week activities, especially in the WhatsApp chat, as they were not familiar with the messaging app. Additionally, there was an increased wariness of telephone scams or online interactions, hence some older participants have mistrust towards the digital tool and prefer in-person interactions.

Theme 2: facilitators

Nevertheless, both groups of participants mentioned that it is possible to implement this intervention program in Segamat, as long as there is time flexibility such as conducting activities during weekends.

> *…depends on people. If his/her work has a lot of spare time, can… can join….* [OP4]

> *…I think if you want to do it on Saturday or Friday, for normal people, okay… depends on what day….* [OP1]

They also stated that this program can be successful if it targets the younger age group, and if a token of appreciation was offered.

> *… I think for young people, maybe about like 17 to like 20, 25 or 30 like that, maybe they have no problem or little problem to finish the task.* [YP4]

Moreover, since SEACO is an established organization based in the Segamat community, the local residents welcome its novel community engagement programs.

> *… for me, it is suitable because before this there's no program like this done by SEACO….* [OP3]

Domain 4: suggestions for improvement

Theme 1: more interesting and easy-to-understand content

For younger participants, adding more interactive graphics would be helpful '*… maybe some graphics can be added in the content of the video, just a few, not so much la… just a few graphics…maybe some people prefer visual learning...*' [YP4]; but the older participants suggested simplifying the content materials by avoiding technical terms so that they are easier to understand.

> *… make simple explanations, try to explain the program in a simple and understandable way. Don't use too professional terms… because we do not have high education, so if use professional term or translate from English, we get confused.* [OP4]

Theme 2: use of local languages

Participants also suggested translating all contents into the local language as an important step for future improvement:

> *… think the first is about the language, maybe once you use the Malay maybe you can use the simplest Malay language then the older can understand what kind of project it is, what we can do and then maybe the video that explains about the activity like what they need to do....* [YP3]

In the focused group with CHWs, they also proposed more design in asynchronous activities to allow for time flexibility (i.e. instead of being expected to submit them immediately, the participants could take their time and reply at any time of the day without being in synchronous with each other).

DISCUSSION

The goal of the RELATE-ME protocol is to offer a blueprint for future full-fledged community-based intervention that targets social connectedness and well-being during national health crises triggered by pandemic or disasters. With the preliminary test of feasibility, we are confident that this is an effective and acceptable form of a culturally responsive intervention that could be used to modulate the effects of the social-isolation and anxiety in a suburban setting in the Southeast Asia region. To overcome the challenges of digital fluency and internet accessibility, we encourage RELATE-ME to be adapted based on the context and population needs, such as delivered via in-person, or hybrid modality, based on the local agency's capacity and accessibility to the community. There are always pros and cons to each modality of delivery, but the two pillars of the RELATE-ME protocol should always be—fostering social connectedness between community members and supporting mental wellbeing through community health workers. When online modality is the only feasible option, for the older population, digital literacy could be built slowly by breaking down the tasks or combining phone-call (rather than Whatsapp) at individual-level intervention.

While the Malaysian government has made considerable progression in the provision of mental health services, which includes the development of the National Mental Health Policy in 1997 and the enactment of the National Mental Health Act in 2000, there remains a lack of resources for mental health services in the country (Raaj *et al.*, 2021; Mudaris *et al.*, 2023). There is a shortage of mental health professionals such

as clinical psychologists, community mental health/psychiatric nurses, social workers and counsellor-occupational therapists. In addition, stigma towards people with mental illness is common among low-middle-income countries, which could be a contributing factor to the delayed treatment of severe mental illnesses. Therefore, even in the post-pandemic era, the RELATE-ME program could also be adapted in the context of enhancing family capacity in rural areas. Some modules such as 'love language', 'conflict resolutions', 'pleasant activities' could be delivered offline under the facilitation of CHW in a series of community programs to build a resilient community as disaster preparedness.

The strength of RELATE-ME lies in its inclusion of the CHW and peer-support group that overcomes both mental health stigma and social isolation for struggling individuals. Different from the professional psychoeducation group or formal intervention, the incorporation of locally elected CHWs as part of the protocol encourages trust-building as peers and sustainability of the relationship within the local community. This explains why some of the participants from the pilot study felt more comfortable in the personal chat with their respective CHW over group chat. In fact, this preference for one-to-one chat could be explained by the appraisal theory (Smith and Kirby, 2009), where the emotional burdens in social interaction in group are greater than in personal chat. However, as the group dynamic evolves into the later stage of re-norming, the emotional burdens could be shared by the group members, and the cognitive efforts required to process social interaction would be less. According to shame resilience theory, by sharing and discussing shame openly, individuals realize they are not alone. Therefore, we are optimistic that RELATE-ME could be productive if it is being offered at full length to create deeper social connections among the members, beyond the connection with CHW individually. We believe the group chat would maximize the normalization effect for the participants in the face of mental health stigma. Having two channels of interaction (with CHW and peer) actually have been the advantage of RELATE-ME, for participants from diverse personalities to build their safety net at the beginning group stage based on their preference. It would be interesting to do a full assessment of the shame-normalizing effect when launching RELATE-ME as a full program over an extended period.

As for capacity building for the CHWs, this protocol would require an extended timeframe for the preparation and skills training, so that the CHWs were more oriented towards the relational aspects of the program rather than its structure and content. Substantial resources were needed to provide incentives and retention of CHWs. The lack of these resources may compromise the sustainability of the program, and advocacy and public campaigns would be crucial for awareness and encouragement of volunteerism in the community. The future direction could be capacity building of CHW during the post-pandemic time, to prepare readiness for crisis responses. Another direction is to expand the existing network of SEACO mental health support, through regular and periodic workshops between supervisory groups, government agencies and non-governmental organizations. Building a coalition between community leaders and the stakeholders would reduce the time in communication and coordination when future crises/lockdowns occur.

Limitations and future improvements of RELATE-ME

This pilot study employed a qualitative approach with a small sample size (total of 12 participants) to solicit feedback on RELATE-ME. While qualitative research is frequently employed to study the lived experiences for community-related intervention, our findings should be interpreted with caution when applying it to the broader context. Future research with a larger sample size from diverse communities is necessary to confirm these initial findings and assess the generalizability of the digital intervention for mental health in multiple developing nations. Though with many foreseeable benefits of the RELATE-ME protocol, we believe the current online learning materials could be further contextualized to the local settings of the community. Securing and training qualified multi-ethnic and/or multilingual CHWs from the suburban community might be challenging, but it would be essential if the intervention is targeted at a heterogeneous community. Moreover, digital platforms or tools might not be applicable to certain rural or marginalized communities that access to internet connections or smartphones. In addition, establishing a supervision and referral network with the mental health personnel would be crucial so that CHWs are not overwhelmed by the challenging participants. A brief orientation meeting online or in-person could be added during the first session, to facilitate trust-building process, rather than waiting until the weekend for group activities. Just like other social media platforms, Whatsapp is not without security challenges, such as end-to-end encryption limitations, risk of hijack, sharing of metadata with the developer company, malware and phishing, lack of anonymity in phone number, limited control over data and vulnerabilities in how media files are stored and accessed. Therefore, to safeguard the ethics of digital intervention, future RELATE-ME protocol could caution the participants about the potential risks beforehand, so that they would not be obliged to share sensitive information over WhatsApp. All participants should be encouraged to delete sensitive information in the group chat after the interventions. For the success and long-term sustainability of the intervention, the agency that employs RELATE-ME needs to secure funding to compensate the CHWs and refer participants who need long-term mental health support. Lastly, future study could employ participatory action research by inviting the participants to shape the contents of RELATE-ME as the program rolls out.

CONCLUSIONS

In short, the RELATE-ME protocol emphasizes the social wellbeing of the remote community through raising awareness of vital relationships, learning mental health improvement skills such as coping and relationship building in a small group format. Though it was developed during the pandemic lockdown period, the RELATE-ME protocol is also versatile, where it could be conducted offline, online or in blended mode, depending on the local contexts and safety protocols during the health crisis or disaster. Its feasibility provides a range of implications to academics, health professionals, policymakers and the public and private sectors, who are interested in promoting mental health and community engagement.

SUPPLEMENTARY MATERIAL

Supplementary material is available at *Health Promotion International* online.

AUTHOR CONTRIBUTIONS

R.S.K.T. designed the RELATE-ME protocol; implemented the feasibility test; trained the CHWs; drafted the first draft of the manuscript and reviewed the last draft of the manuscript. H.S.Z. interviewed the CHWs and participants; coded the transcripts; prepared the tables, figures and supplementary files and drafted the *Result* section. A.C.W. implemented the feasibility test; recruited the CHWs and coordinated the pilot-test. J.K.C. trained the CHWs; assisted in the literature review and reviewed the last draft of the manuscript. M.M.T. conducted a systematic review of the literatures and reviewed the last draft of the manuscript. T.T.S. conceptualized the project; secured funding; oversaw the project implementation; responsible for community and stakeholder engagement and reviewed the last draft of the manuscript. All authors approved the final manuscript.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

DATA AVAILABILITY

The data underlying this article are available in the article and in its online supplementary material.

ETHICS APPROVAL

The study was approved by the Monash University Human Research Ethics Committee (MUHREC) (approval numbers: 25807 and 27445), and the World Health Organization: Western Pacific Region Office (WHO: WPRO) (approval number: 2021.1.MAA.1.MHI).

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