ORIGINAL ARTICLE

Effectiveness of a Program on the Participatory Behaviors in Schizophrenic Patient Rehabilitation by Health Volunteers: A Mixed Methods Approach

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Background: The rate of Thai patients receiving psychiatric services had increased between 2015 and 2017 from 1.5 to 2.7 million. Thus, communities are important for reducing the disability of schizophrenic patients.

Objective: To design a community-based rehabilitation program (CBRP) for schizophrenic patient rehabilitation and assess the effectiveness of CBRP on participatory behavior among village health volunteers (VHVs).

Materials and Methods: The present study was a mixed-methods research done between August 2021 and January 2023. In Phase 1, the study was conducted using in-depth interviews with open-ended questions, covering health belief areas with key informants that included schizophrenia patients, caregivers, community leaders, health personnel, and experts. The content validity with the item-objective congruence (IOC) was evaluated by five experts yielding a high level of congruence with scores ranging from.60 to 1.00. In Phase 2, experimental research was conducted on 40 VHVs in a randomized controlled trial divided into experimental and control groups, with 20 volunteers in each group. The instrument included health belief patterns, incentives, and participation behaviors in schizophrenic patient rehabilitation. The questionnaire used a 5-rating scale with a Cronbach's alpha of 0.83 to 0.91. The CBRP consisted of four activity sessions over four weeks, measured at three intervals, pre, post, and follow-up. Content analysis and MANOVA were used for data analyses.

Results: In Phase 1, the findings indicated that the perceived risk/severity of schizophrenia was due to lack of treatment and non-adherence to medication. Lack of knowledge about the disease and community stigma were significant barriers. The perceived benefits of treatment included continuous medication adherence. Motivational perception included community support for psychiatric patients, community involvement, and self-efficacy involving access to support resources, patient readiness, and genuine acceptance from family and community. These perceptions were used in the design of the CBRP. In Phase 2, the experimental results showed that the average scores for health belief patterns, incentives, and participation behaviors in schizophrenic patient rehabilitation were significantly higher in the experimental group compared to the control group and the pre-experimental period ($p<0.001$).

Conclusion: The CBRP can aid VHVs in dealing with schizophrenic patients. It improved health beliefs, incentives, and participation in rehabilitation, and can be implemented with health personnel in communities, offering a promising application for various communities.

Keywords: Community-based rehabilitation; Schizophrenia; Village health volunteer; Participatory behavior

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Schizophrenia, a long-term mental health condition that frequently leads to relapses and significantly disrupts everyday life and occupational functioning[1,2], resulting in disability and reduced quality of life[3]. The World Health Organization (WHO) ranks schizophrenia as one of the top three diseases with the most disabling effects[4] from the perspective of handicap and disability compared to other mental disorders identified as leading causes for both genders by the Global Burden of Disease Study[5,6]. It is estimated that there are over 26 million people with schizophrenia worldwide, with a lifetime prevalence of 7 per 1,000 people in the adult population. The majority (90%) are in developing countries. Despite its prevalence, service access and treatment for schizophrenia remain major obstacles[7]. According to the overall report of psychiatric patients receiving psychiatric services under the Department of Mental Health, it is estimated to have increased

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from 1.5 to 2.7 million individuals between 2015 and 2017[8]. Schizophrenia is one of the five psychiatric disorders with the highest recurrence rate and lifelong severe symptoms[9,10], up to 80% of patients return repeatedly to the hospital[11].

Currently, caring for schizophrenic patients has shifted from hospital-based to family-community-based care[12]. Rehabilitation plays a crucial role in allowing patients to live with their families and society, receiving social support from the community[13,14]. This allows community health leaders to gain knowledge of caring for schizophrenic patients at home and create an implementation plan to reduce recurrence and restore quality of life[15]. The process requires collaboration among local organizations, primary health service centers, and social support from family, relatives, siblings, neighbors, and community leaders, driven by people's participation[16]. Village health volunteers (VHVs) play an important role in helping and restoring social skills[17] and ensuring continuous care. Thus, a community-based rehabilitation program (CBRP) is important for the sustainable care of schizophrenic patients[18-20], reducing disability, and enhancing social interaction[21,22]. The community-based rehabilitation (CBR) process consists of four steps, 1) situation analysis, 2) planning and design, 3) implementation, and monitoring, and 4) evaluation[23]. There are few studies on CBR involving schizophrenia due to the need for close collaboration among psychiatric specialists, health providers, caregivers, families, and community leaders, collaborating closely with various stakeholders to address the healthcare needs of people with schizophrenia[24]. Therefore, it is crucial to have VHVs who understand the health belief model (HBM) of schizophrenia to successfully motivate patients toward rehabilitation and behavioral change. People must be cognitively and mentally prepared, considering the perceived risk and severity of the disease, the perceived benefits, barriers, threats, and costs, motivation for action, related factors, and self-efficacy[25,26].

Previous research has shown that CBR is used abroad and has been effective in creating an environment to treating schizophrenic patients and overcoming sociocultural and economic barriers[21,27]. CBR has also been shown to improve symptoms and increase the quality of life for the patients[28,29]. Consequently, CBR for schizophrenic patients is an interesting topic for rural society. However, the practice has revealed gaps in proactive work within the community. There is still low participation in rehabilitation by the community network[23], leading to inadequate analysis of real problems and needs. Consequently, involving the community more effectively in continuous rehabilitation can be highly beneficial[24]. In addition, the policy of the Department of Mental Health is to promote enhanced CBR. The objectives of the present study were to examine the HBM of schizophrenic patients and test the effectiveness of the CBRP on the participation of VHVs under the concept of HBM and CBR. The study was conducted in a community in Kiriratnikhom District, Suratthani Province, which has the highest number of psychiatric patients with 189 persons, and more than 60% of them were ill with schizophrenia. The present study focused on various aspects, including the variables involving the implementation of CBRP in schizophrenic patients for VHVs. The dependent variables included the health beliefs of schizophrenia, the perceptions and beliefs surrounding it, and incentives to participate.

Materials and Methods

The present study was a mixed methods study, conducted between August 2021 and January 2023.

Participants

Phase 1: The creation and design of the CBRP. Qualitative research was conducted to study the health belief patterns of schizophrenia and participation behavior. Twelve informants by criterion sampling consisting of schizophrenic patients, caregivers, community leaders, public health providers, and specialists were included. In-depth interviews were conducted for data collection. The research results from the qualitative data were utilized to design the draft intervention, incorporating the conceptual frameworks of the HBM and CBR, along with relevant literature reviews.

Phase 2: It consisted of experimental research. Forty VHVs participated in the program by cluster randomized sampling from nine villages in a province of southern Thailand to reduce bias. The sample size was determined using Cohen's calculation principle according to the G*Power program[30]. Within each selected village, lots were drawn from the list of VHVs to include 20 people in each of the experimental and control groups by random assignment. Participants were asked about their willingness to participate in the program and were included based on specific criteria with at least one year of experience in caring for schizophrenic patients and never participated in a rehabilitation skills program with exclusion

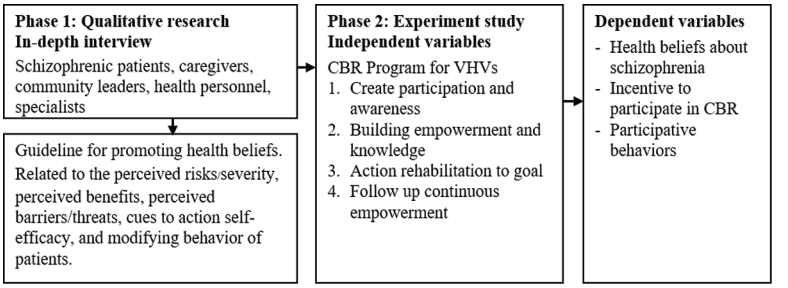

Figure 1. Research framework.

criteria applied to ensure the sample's relevance and appropriateness for the present study as shown in Figure 1.

Instruments

The data collection instruments developed by the researchers covered dependent variables, health beliefs, incentive to participate, and participatory behavior. They consisted of 1) the in-depth interviews utilized a well-crafted set of open-ended questions tailored to the distinct types of informants. These questions covered five important health beliefs, perception of risks and severity of schizophrenia, benefits, barriers, motivations, and self-efficacy, 2) the demographic data form including gender, age, marital status, education level, employment, and VHVs experience, 3) a 40-item health belief scale on schizophrenia that covered five important health beliefs perceptions, 4) a 12-item incentive to participate scale, and 5) a 20-item participatory behavior scale for schizophrenia rehabilitation using a 5-point rating scale. The tool quality was evaluated by five experts in the field of psychiatry including three psychiatric nursing instructors, a psychiatric nurse, and a psychiatric social worker using content validity analysis, yielding a high level of congruence with scores ranging from 0.60 to 1.00 on the item-objective congruence (IOC). The IOC values of the items were 0.87, 0.90, and 0.89, respectively. The Cronbach's alpha coefficient was 0.83, 0.96, and 0.91, respectively, indicating good internal consistency. The researcher manually collected data to avoid any missing data.

The experimental instrument was the CBRP. The content of the CBRP was validated by five experts that included three psychiatric nursing instructors and two instructors of modified behavioral science research field to assess accuracy, clarity, coverage, appropriateness of time, language used, format of activities, content sequence, and consistency between topics and objectives. The IOC was found to be 0.89. Additionally, the tried-out program was assessed using a small sample of 10 VHVs. The findings indicated that after receiving the program, the mean scores for health beliefs, incentives, and participation behavior were higher than before the experiment ($p<0.05$). The CBRP was developed based on the HBM[25]. This program aimed to address the perception of health belief patterns related to schizophrenia, encompassing aspects such as the perceived risks and severity of schizophrenia, obstacles to recovery, benefits of accessing treatment and rehabilitation resources, and the motivation to take action to enhance the abilities of individuals. The program was also integrated with the concept of CBR, as reported by WHO[23]. The CBR management cycle empowered the VHVs, enhancing their potential to effectively support schizophrenic patients. The program comprised four steps and nine activities, with each activity having a specific duration. Activities 1 to 4 each lasted 360 minutes. Activities 5 each lasted 360 minutes. Activities 6 to 7 each lasted 720 minutes. Activities 8 and 9 each lasted 360 minutes. Group activities were held weekly for a duration of four weeks. The program was designed to promote collaboration among the volunteers to provide effective support and rehabilitation to patients with schizophrenia. The proposed CBR used in the schizophrenic patients' program for VHVs as depicted in Table 1.

Ethical approval

The present research received ethical approval from the Srinakharinwirot University Board of Ethics under certificate No. SWUEC/E/G-150/2021.

Statistical analysis

Content analysis was employed to analyze the qualitative data in Phase 1 and one-month follow-up after the program in Phase 2. The findings were

Table 1. CBR in schizophrenic patients program for VHVs

Weeks	Time	Activities
Week 1 Step 1 Create participation and awareness	360 minutes	Activity 1: Build relationships and share experiences Activity 2: Explore the problem situation and community needs Activity 3: Enhance power to create motivation Activity 4: Install hope, and set goals
Week 2 Step 2 Empowerment and knowledge-building	360 minutes	Activity 5: Adjusting one's health beliefs to understand schizophrenia 5.1: Perceived risks and severity in schizophrenia 5.2: Perceived benefits of treatment, rehabilitation in the community, and social support 5.3: Recognizing barriers and problem management
Week 3 Step 3 Rehabilitation to goal	720 minutes	Activity 6: Rehabilitation of schizophrenic patients: the principle of rehabilitation for the patient, life experience of caregivers and schizophrenic patients, learning to rehabilitate life, social, and career skills, design activities for rehabilitation of schizophrenic patients in the community context, and experiment with them
	3 days	Activity 7: Rehabilitation, home visit practice (theory and practice), community practice
Week 4 Step 4 Follow up continuous empowerment	360 minutes	Activity 8: Rehabilitate abilities Know how to take care of your health Activity 9: Rehabilitate what you remember from obstacles (exchange of learning experiences)

confirmed using triangulation, which involved cross-referencing data, methods, and theory. As a rule of thumb, at least two out of three researchers reached an agreement in the event of differences in opinion. The quantitative data were collected from the participants using questionnaires. The assessment was conducted three times, pre-experimental, post-experiment, and follow-up after one month, for both the experimental and control groups. The data were analyzed using descriptive statistics and IBM SPSS Statistics, version 26.0 (IBM Corp., Armonk, NY, USA). A multivariate analysis of variance (MANOVA) was performed for the dependent variables. Before analysis, the basic assumption test was done by testing the values of skewness, and kurtosis along with Shapiro-Wilk to test the statistical significance of the data distribution, Box's M test to examine the variance-covariance matrices, and Levene's test to examine the equality of all variances. The results showed that variances were significant at 0.05, 0.01, and 0.001. Z-values of skewness and kurtosis were according to the criteria. Therefore, data can be analyzed using MANOVA.

Results

The study of qualitative research in Phase 1 revealed the following health belief patterns of schizophrenia among the informants, 1) the perceived risk of disease recurrence due to delayed access to services, intermittent care, lack of medication, and substance abuse, leading to awareness of the impact on the health of the individual and others, 2) recognition of the benefits of treatment, rehabilitation, and available support resources, along with identifying barriers to health care, 3) motivation for action arising from social influences, such as promoting correct knowledge, forming groups, encouraging one another, and collectively demonstrating abilities by contributing positive energy, and 4) understanding the HBM of schizophrenia and identifying participatory behaviors. Four key issues were identified to improve the community's role in patient rehabilitation, which were providing information to the community, enhancing knowledge of mental health and psychiatry, planning rehabilitation skills, and fostering collaboration with network partners.

Demographics in the experimental study in Phase 2, the majority of the participants were aged from 50 to 59 years, which was eight subjects (40%), and were married in the case of 19 subjects (95%). Regarding their experience as volunteers, eleven (55%) had volunteered for periods ranging from one to six years and 16 (80%) were farmers. When comparing the experimental and control groups, no significant differences were found in age, experience as a volunteer, marital status, education level, and occupation. However, the control group had more female participants than the experimental group.

In the MANOVA analysis, the average of schizophrenia health beliefs, participation behaviors, and incentives in the pre-experimental measurements indicated no significant differences between the experimental group and the control group (Wilks's lambda 0.69, p=0.29). This suggested the dependent variable group, encompassing all three aspects, had equal test scores during this period. However, post-experimental and follow-up measurements revealed significantly different scores between the experimental

Table 2. Comparison of mean pairwise scores of health beliefs, participation behaviors, and incentive for classification after trial between the experimental (T) and the control (C) group

Variable	Group	Post-test				Follow-up			
		Mean	SE	MD (d)	SE	Mean	SE	MD (d)	SE
Health beliefs									
Schizophrenia perception	T	4.21	0.11	0.56**	0.15	4.58	0.09	01.05***	0.19
	C	3.65	0.11			3.52	0.09		
Risk and severity	T	4.35	0.09	0.44**	0.13	4.58	0.08	0.780***	0.12
	C	3.91	0.09			3.81	0.08		
Benefits of rehabilitation	T	4.39	0.08	0.69***	0.11	4.59	0.09	0.914***	0.12
	C	3.70	0.08			3.67	0.09		
Barrier towards schizophrenia	T	4.15	0.07	0.51***	0.09	4.29	0.07	0.664***	0.09
	C	3.65	0.07			3.62	0.07		
Self-efficacy	T	4.22	0.09	0.86***	0.12	4.28	0.07	0.970***	0.09
	C	3.36	0.09			3.31	0.07		
Participation behavior									
Co-decision	T	4.12	0.11	1.19***	0.16	4.24	0.07	1.33***	0.10
	C	2.93	0.11			2.91	0.07		
Co-operate	T	4.08	0.12	0.82***	0.18	4.14	0.11	0.950***	0.16
	C	3.26	0.12			3.19	0.11		
Share the benefits	T	4.08	0.12	0.55**	0.17	4.45	0.11	1.04***	0.15
	C	3.53	0.12			3.41	0.11		
Participate in evaluation	T	4.04	0.12	1.05***	0.17	4.44	0.10	1.52***	0.13
	C	2.99	0.12			2.92	0.10		
Incentives in rehabilitation	T	4.22	0.07	0.87***	0.10	4.35	0.06	1.07***	0.08
	C	3.35	0.07			3.28	0.06		

SE=standard error; MD=mean difference
** $p<0.01$, *** $p<0.001$

and control groups (Wilks's lambda 0.19, $p<0.001$ and Wilks's lambda 0.05, p<001, respectively). The results of the test on the differences between groups concerning health beliefs, participation behaviors, and incentive scores revealed that 1) in the post-test, there were statistically significant differences ($p<0.001$) in all five aspects of health beliefs and four aspects of participation behavior scores between the experimental and control groups, 2) in both the post-test and follow-up, significant differences ($p<0.001$) were observed in incentive scores between the groups, and 3) in the follow-up period, there were statistically significant differences ($p<0.001$) between all dependent variables, as shown in Table 2.

Table 2 presents the results of the comparison between the mean pair scores for health beliefs of schizophrenia, participation behaviors, and rehabilitation incentives between the experimental group and the control group in the post-test and one-month follow-up, demonstrating that the experimental group had significantly higher scores than the control group at the 0.01 and 0.001 levels in all aspects. All analyses results indicated that in the experimental group participating in the program, the level of schizophrenia health benefits, incentives for participation in the rehabilitation of patients, and participation behaviors in the rehabilitation of patients with schizophrenia increased more than in the control group, as shown in Figure 2.

The results of the follow-up during the one-month post-trial period revealed valuable qualitative data, supporting the effectiveness of the CBRP. The program fostered a supportive environment, encouraging new knowledge exchange among participants. Overall, participants felt that the program had a beneficial effect on individuals with schizophrenia, their families, and the broader community. The program contributed to building teams with cooperative attitudes and a strong sense of collaboration. The findings from the follow-up evaluation shed light on the program's success in achieving its objectives and further elucidate its positive effects on participants, schizophrenic patients, their families, and the broader community.

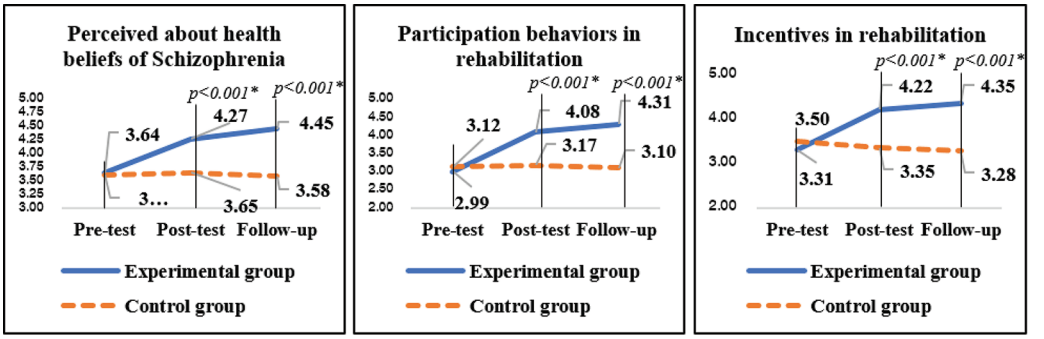

Figure 2. Line graph showing the comparison of mean pair scores of dependent variables.

Discussion

The findings revealed the health beliefs of schizophrenia patients, including their perception of risk, opportunities, severity, the benefits of preventing recurrence, and obstacles to rehabilitation, played a crucial role in understanding the HBM of schizophrenia. This understanding can lead to changes in behavior, and lifestyle-related diseases in patients with schizophrenia by contributing to a better comprehension of schizophrenic patients[26]. The present study applied the HBM along with the concept of CBR to develop the program[23] through the CBR management cycle, situation analysis, planning and design, monitoring, and evaluation. The present study selected the appropriate components of the CBR matrix based on the context and local resources of the area through a participatory learning process and practical experiments involving VHVs who participated in the program. In line with CBR guidelines, creative community service workers were trained to provide services to recipients, resulting in a positive social impact. Additionally, the program facilitated enhancements in community attitudes and promoted a greater sense of integration into society[31]. Combining the HBM with CBR principles led to changes in the scores of the variables under study.

Regarding the effectiveness of the program, this positive outcome may be attributed to the program being based on the HBM concept, focusing on easy-to-understand, practical learning experiences conveyed in a clear format. The program was structured as follows, Step 1: Creating participation and awareness, developing attitudes, knowledge, and skills for patient rehabilitation. Encouraging VHVs to work together to understand schizophrenic patients, their caregivers, and community issues and setting plans and goals for patients. Stressing cooperation in mental health care from all sectors. Sharing experiences despite lacking confidence due to limited mental health knowledge. Seeking teamwork and family communication. A few participants realized the need for collective action to address mental health issues, highlighting the importance of community involvement and diverse perspectives, promoting cooperation among stakeholders such as leaders, volunteers, and patients. Education was used to boost the mental health confidence of VHVs and encourage collaboration and community engagement to create solutions. To make a meaningful impact, it was crucial to encourage VHVs to collaborate in enhancing grassroots mental healthcare. Step 2: Empowerment and knowledge building, the participants received knowledge through analytical thinking and action based on the planned activities. They developed an understanding of schizophrenia, which involved perceiving the risks, severity, and benefits of treatment, and rehabilitation. This understanding aligned with previous studies on the role of health belief patterns in promoting positive changes in health behaviors[32,33]. Volunteers' reflections show the positive impact of improving understanding of mental illness. Promoting knowledge of treatment and social skills along with encouraging a compassionate approach to care and its practical application in-home visits to prevent illness recurrence and provide support, especially team building for home visits. Improving the ability of VHVs to assist patients and families promptly using a color-coded system of green, yellow, and red. The volunteers' reflections highlighted the benefits of improving knowledge and practical skills. Step 3: Rehabilitation, to achieve the goal of rehabilitation, the experimental group planned appropriate rehabilitation activities, focusing on motivation and community involvement by developing disability rehab models and encouraging home-based care. Encouraging practical training, goal setting, and learning to enhance self-awareness, with tailored support for families to boost the impact.

The program assisted volunteers in providing tailored programs to enhance care and support for families. The week-long practical training was highly beneficial, enhancing the skills and potential of volunteers. Those in the experimental group showed growth in goal setting, planning, action-taking, feedback learning, and mutual encouragement. These experiences improved their awareness of the strengths and potential impact. The VHVs devised strategies aligned with their specific circumstances. Returning information and support to the community are key to starting effective rehab care. Promoting collaborative and supportive surroundings allows VHVs to develop their skills and potential, leading to personalized home-based rehab for patients. Step 4: Sustained empowerment through ongoing follow-up, continuing the program for reflection and a progress assessment, allowing the VHVs to gain self-efficacy, motivation, and patient support, with patients benefiting from encouragement and knowledge. The group learned about teamwork and behavior modification, aligning with the CBR participation concept[34]. Combining the effective CBR model with HBM and participation to address real community problems and encourage solutions[28,29,35] was done. This allows the volunteers to appreciate the program's relevance for practical, versatile, and effective problem-solving. The volunteers expressed their gratitude for the knowledge and training that allowed them to take better notice of mental symptoms. The volunteers were eager for internships and careers, as well as developing a positive relationship with patients.

Conclusion and limitation

CBRP can aid VHVs and local leaders in CBR when dealing with schizophrenic patients. The study outcomes and data support the program's potential for wider use, benefiting patient care. The programs demonstrate improved health beliefs, incentives, and rehab participation and offer a promising application for various communities.

However, due to time limitations inherent in the research study, the expansion of results became unfeasible. As an alternative, CBRP was shared within the public health network of the Eleventh health district. Its deployment aimed to harness the potential of community health leaders. Most participants in the sample were adults aged between 50 and 59 years, and the experiment's small sample size was confined to the southern region. Consequently, the CBRP should first be implemented for VHVs in the southern communities of Thailand.

Future research and intervention evaluations should include large sample sizes, young age VHVs, and longer follow-up periods, such as three to six months or one year, to assess the sustainability of learning, changes, and outcomes for schizophrenic patients.

What is already known on this topic?

Overall, the feedback from the volunteers aligns with the success of the intervention. A proactive, practical approach positively impacts mental health care for patients, while a supportive environment boosts motivation and outcomes. CBRP, driven by volunteer participation, has proven to be efficient and effective. Positive feedback from patients and families signifies a meaningful impact. The mix of experimental data and qualitative feedback ensures a comprehensive assessment, supporting the ongoing success of the intervention. The CBRP for schizophrenic patients can serve as a valuable model for other communities and areas. To ensure successful implementation in different contexts, it is essential to adapt the activities and approaches to suit the specific needs and resources of each community. CBRP training should be conducted for users, covering the content, steps, and processes involved in the intervention to ensure its efficient and effective delivery to the target groups.

What does this study add?

A specific area was chosen to conduct a trial implementation involving a cohort of VHVs. The primary objective of this trial was to meticulously examine the program's efficacy. The assessment encompassed its overall effectiveness and the advantages offered for the rehabilitation of individuals with schizophrenia within the community. This study included health volunteers working in healthcare professions, utilizing adjusted behavioral scales to evaluate their participatory behaviors in schizophrenic patient rehabilitation in communities, mental support patients' families, and reducing mental health risks in communities.

Acknowledgment

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Conflicts of interest

The authors declare no potential conflicts of interest.

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