Original Article

Multimodal intervention on perception and quality of life of geriatric clients regarding health promotional outcomes at a selected hospitals, Kolar, Karnataka, India

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Abstract

Background of Study: Old age is a privilege for a second childhood and a new stage of opportunity and strength. Older adults are the most rapidly growing segment of the population. By 2050, 80% of all older people will live in low- and middle-income countries. **Purpose:** To evaluate the effectiveness of multimodal intervention on perception and quality of life among geriatric clients. **Methods:** Quantitative approach quasi-experimental interventional controlled study with pre-test, post-test design and follow-up for two months, adopted by using purposive sampling technique among 120 geriatric clients who gave consent for participation in the study at two different settings of hospitals from July 2022 to January 2023, Kolar. After obtaining Central Ethics Committee approval, data was obtained using the structured perception questionnaire and WHO Quality of Life questionnaire, and the Multimodal Intervention package consisting of a snake and ladder health promotion strategies game, educational video, and informational pamphlet distributed to the experimental group, whereas routine care was given to the control group followed by post-test group on the 30th and 60th day. Reinforcement was carried out by the investigator on a fortnightly basis reminders through messages. Data were analyzed by using descriptive and inferential statistics such as repeated measures of ANOVA, independent '*t*'-test, paired '*t*-test, and Chi-square. **Results:** A perception significant effect was demonstrated in the experimental group with enhanced mean, standard deviation from pre-test to post-test I and Post-test II found to be 35.1 ± 7.9, 46.3 ± 6.1, and 48.3 ± 4.7, respectively, without significant changes in the control group. Concerning quality of life, important variations were demonstrated in the experimental group with enhanced mean, SD from pre-test to post-test I and Post-test II found to be 54.76 ± 10.39, 74.15 ± 6.75 and 77.71 ± 4.99, respectively, without any significant changes in the control group. **Conclusion:** Geriatric population was the biggest beneficiary, multimodal intervention was proven to be effective and can be implemented in hospitals and community settings in improving the perception and quality of life of senior clients to foster healthy aging.
CTRI Trial Reg no: CTRI/2021/07/034632.

Keywords: Geriatric, health promotion, multimodal intervention

Introduction

Aging is a natural phenomenon with opportunities and challenges.[1,2] Aging cannot be prevented, but we can learn how to deal with rising conditions to achieve greater health among geriatric to lead a healthy life by understanding their needs and concerns, which is inevitably the ideal way to

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focus on comprehensive holistic health promotion measures through multimodal Intervention strategies to enhance a higher perception and quality of life (QOL).[3-5]

As per the key facts of aging per WHO 2022, between 2015 and 2050, the proportion of the world's population over 60 years will nearly double from 12% to 22%.[6-8] Health promotion is a vital component among the elderly. In such a situation, health issues can be effectively addressed by adopting a holistic approach to health promotion by empowering individuals and communities to implement actions to enhance healthy aging strategies and create an age-friendly environment.[9,10]Although studies highlighted older adults' health problems and physical, cognitive, and selected aspects of interventions, a gap existed to focus on holistic health promotion interventions.[11,12]

The current study explored novel interventions to promote healthy aging by emphasis on perception and QOL-delivering multimodal intervention strategies to address the health promotion measures that require awareness and motivation, focusing on holistic health promotion and educational videos, snake and ladder health-promotion games, and an informational pamphlet that briefs the holistic measures to promote positive health outcomes that are essential in national and global settings.[13-15]

Health-promotion needs to be built as a national policy to reduce hospital readmissions, and exclusive geriatric consultations and in-patient wards to be implemented to reduce waiting time self-management health-promotion measures to be utilized efficiently to lead to positive health outcomes.[16-18]

Materials and Methods

Ethics

This study received ethical approval from the institution's ethics committee on 09.03.2021. The steering committee had oversight of the study processes.

Selection and description of participants

Volunteer inclusion criteria were adults aged ≥60 years, seeking medical services at in-patient departments, able to speak and understand Kannada or English, and accessible for follow-up throughout the study period by providing written consent. Key components of multimodal intervention include physical activity, nutrition, fall prevention, socialization, medication regime, spiritual aspects, and health schemes. Participant recruitment of older adults aged ≥60 years who are seeking medical services at R.L.J. Hospital and Research Centre, Tamaka, Kolar (n = 60) in the experimental group and District Government SNR Hospital for the control group (n = 60) were recruited by using a purposive sampling technique between June 2022 and January 2023. The experimental group was given multimodal intervention, whereas the control group received routine care. Participants who had a physical and mental disability, which did not allow them to participate in the multimodal intervention, and terminally ill were excluded from the study.

A researcher visited the hospitals and introduced the study. Patient information sheets and written consent forms were given to older adults, which were translated into the regional language who were interested in the study. Upon returning the consent forms, participants were invited to attend the study for 2 months. A sample size of 120 participants was chosen in line with previous sample size recommendations for feasibility studies.

Sample size calculation

The sample size is 60 in each group (60 experimental and 60 control group) based on data from a similar *study (Sharif F, Jahanbin I, Amirsadat A, Moghadam MH. Effectiveness of life review therapy on* QOL *in the late-life at daycare centers of Shiraz, Iran: a randomized controlled trial. International Journal of community-based nursing and midwifery. 2020 Apr;6(2):136.)*[19]

By employing the OpenEpi statistical software (power 80%, 95% confidence interval) expecting an attrition rate of 5% and the difference of mean QOL scores between Group 1 was mean 18, SD 2.6, variance 6.76 and Group 2 mean scores 20, SD of 2.65, variance 7.02, the estimated sample size was around 56 in each group. If 5% of the sample's dropouts were taken into account, the estimated sample size was around 60 in each group.

Considering the Cochran's formula:

$$n = \frac{2(Z\alpha + Z1-\beta)\sigma 2}{d^2}$$

$Z\alpha$ = 95% Confidence Interval.

$Z(1-\beta)$ = Power of the study as 80%.

$\sigma 2$ Average variance estimation.

d = Effect size.

Sampling criteria

Inclusion Criteria: Includes the geriatric clients who are

1. Between the age group of 60 and 75 years.
2. Seeking medical services at In-Patient departments.
3. Able to speak and understand Kannada or English.
4. Accessible for follow-up throughout the study period.
5. Having mobile phones.

Exclusion criteria:

1. Physical and mental disability, which does not allow them to participate in multi-modal intervention
2. Who is terminally ill
3. Who is not willing to participate in the study.

Study design

Quantitative approach experimental interventional study with pre-test post-test design and follow-up study.

Tools and data collection

The study comprised tools with sociodemographic proforma containing participants' age, gender, marital status, educational qualification, type of family, comorbidities, health checkups undergone, and bio-physiological parameters assessed, such as nutritional status, vision, hearing acuity, sleep pattern, bowel and bladder pattern, physical activity per day, was recorded to provide participants' baseline characteristics. An experts validated researcher developed a perception questionnaire consisting of 15 items used to assess the perception highlighting the domains of aging perception, physical psychological well-being, financial aspects, and social relationships,[20] whereas standardized WHO QOL consists of 24 items on areas of sensory abilities, autonomy, past present, and future, social participation, death and dying, and intimacy[21] was intervened to state their responses according to their personal opinions; and an explanation was given for the status of QOL for those who needed clarification. For each question, their response was obtained. The duration of each test was a minimum of 15–20 minutes. Data collection was carried out by a researcher for 5 months. The pre-test was administered on the first day with the contact details of participants/caretakers as mentioned in Table 1.

Later, the participant of the experimental group was given a multimodal intervention, whereas the control group received the routine care of the hospital. All the geriatric clients were given the contact details of the investigator and informed about the weekly reminders through telephonic conversation to participants and the post-test I on the 30th and post-test II on the 60th day. Feedback/opinnionaires from participants were collected and found to be an excellent intervention as its mentioned in Table 2.

Intervention

The multimodal intervention consists of educational video teaching, a snake ladder game, and an informational pamphlet given after the pre-test consisting of the perception questionnaire consisting of a five-point Likert scale and WHO QOL tool with 24 items for 20 minutes; the educational video teaching was prepared by the researcher in the regional language, and snakes and ladder health-promotion game was developed as learning through playing and informational pamphlet consisting of holistic health-promotion strategies; participants were reinforced and followed up by weekly reminders through telephonic conversation for 2 months. They returned to in-person visits, in which the intervention continued face-to-face. The intervention was carried out for 15 minutes for each geriatric client.

Primary outcome measures

The feasibility of implementing the intervention was determined by:

1. The number of volunteers recruited, undergone intervention, and retained.
2. The number of older adults recruited.[22]

Secondary outcomes

Perception and QOL levels were assessed by the perception questionnaire and WHO QOL questionnaire. Geriatric clients have been the biggest beneficiaries; the intervention serves as a protocol and QOL empowering strategy to implement at hospitals and communities to promote healthy aging. Through the study, the geriatric clients need health-promotion measures, and further financial welfare measures can be initiated by the government for the senior citizens.[23] All outcome measures were recorded at baseline and repeated at 1 and 2 months, and no adverse events were reported.

Analysis baseline characteristics of participants were reported as mean or median, standard deviation, frequency, and percentage.

Results

Figure 1 shows that in the experimental group, the pre-test perception score (mean ± SD 35.7 ± 7.9) was significantly less (P = 0.001) than the perception scores of both post-tests (mean ± SD post-test 1 = 46.3 ± 6.1, post-test 2 = 48.3 ± 4.7). Partial Eta squared value (ηp^2 = 0.6816) indicates a large effect size with Wilks lambda value of 0.319 significant at 0.000, which suggests that multimodal intervention is very effective in increasing the perception regarding health-promotional outcomes among geriatric clients.

Figure 2: The QOL scores were analyzed by using repeated measures of analysis of variance (ANOVA) to check the differences between the groups. The mean and SD in the experimental group during the pre-test is 54.76 with SD 10.39, Post-test I 74.15 with SD 6.75, whereas in Post-test II 77.71 with SD 4.99, respectively, with an increase in the mean perception scores from the pre-test to post-test II. This difference is with Wilks lambda value of 0.189 and a significant P value of 0.000, which is less than the confidence level ($P < 0.05$). Thus, it could be assumed that multimodal intervention from pre-test to post-test II was proven to be effective in promoting the QOL of geriatric clients. In the control group, during the pre-test, the

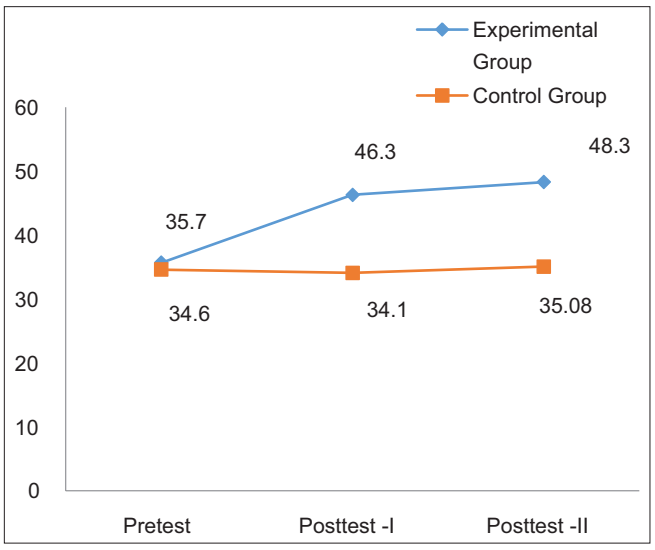

Figure 1: Repeated measures of ANOVA of perception and geriatric clients

mean, and SD were 55.85, SD 12.72, post-test I 55.46 and 11.55, and post-test II was found to be 52.31 with an SD of 11.3 with no significant difference.

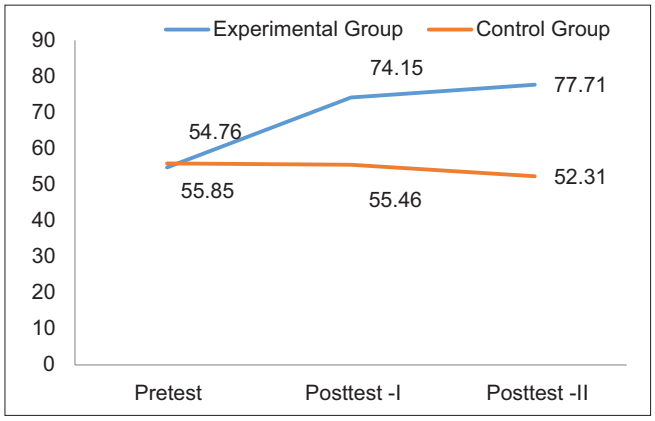

Figure 2: Repeated measures of ANOVA and quality of life of geriatric clients

Discussion

It was feasible and safe to deliver a multimodal intervention among geriatric clients in health care and community settings. The intervention was acceptable to geriatric clients and caretakers, and it can be developed as a protocol to improve health-promotion-outcome measures among the elderly.[24] A key to success was the video teaching and snake and ladder game support to upskill older adults' perception and improve their QOL and confidence to engage with the intervention. This study adds to a burgeoning evidence base, suggesting that volunteers can take more direct roles in supporting older adults and can successfully deliver a multimodal intervention with proper training.[25] A systematic review of 18 studies found evidence suggesting that health-promotion interventions are essential to improve the perception and QOL and improve health outcomes of community-dwelling older adults, including functional status, frailty status, and reduction in fear of falls.[26] This study adds to existing research by exploring how best to recruit all sensory

Table 1: Methods and type of statistics used for the study

Methods	Type of Statistics	Purposes
Descriptive Statistics	Frequency, percentage, mean, SD	Participants socio-demographic characteristics
Inferential Statistics	Paired '*t*'-test	Compare the outcome variables before and after intervention within the group
	Independent '*t*'-test	Compare the outcome variables before and after intervention between the groups
	Repeated measures of ANOVA	Assess differences in outcome over time.
	Chi-square	Find an association of selected socio-demographic variables with outcome variables

Table 2: Distribution of the geriatric clients of the experimental and control groups based on their socio-demographic characteristics (*n*=60 + 60)

Demographic Variables	Category	Study groups *f* (%)		d*f*	χ^2 (*P*)
		Experimental	Control		
Age (in years)	60–67	41 (68.3)	47 (78.3)	1	1.534 (0.2155) NS
	68–75	19 (31.7)	13 (21.7)		
Gender	Male	33 (55)	25 (41.6)	1	2.135 (0.1439) NS
	Female	27 (45)	35 (58.4)		
Educational status	Formal Education	23 (38.3)	21 (35)	1	0.143 (0.7047) NS
	No formal education	37 (61.7)	39 (65)		
Religion	Hindu	34 (56.6)	41 (68.3)	2	1.845 (0.3973) NS
	Muslim	18 (30)	14 (23.4)		
	Christian	8 (13.4)	5 (8.3)		
Marital status	Married	43 (71.6)	41 (68.3)	2	0.695 (0.7063) NS
	Separated	6 (10)	9 (15)		
	Widow/Widower	11 (18.4)	10 (16.7)		
Residence	Rural	42 (70)	46 (76.6)	1	0.681 (0.4089) NS
	Semi-urban/Urban	18 (30)	14 (23.4)		
Socioeconomic status	APRIL	13 (21.6)	15 (25)	1	0.1863 (0.6659) NS
	BPL	47 (78.4)	45 (75)		
Type of family	Nuclear family	18 (30)	21 (35)	1	0.341 (0.5587) NS
	Joint family	42 (70)	39 (65)		
History of comorbidity	Diabetes and Hypertension	40 (66.6)	47 (78.3)	1	2.048 (0.1524) NS
	Cardiac and other health problems	20 (33.4)	13 (21.7)		
History of health checkup	No	33 (55)	41 (68.3)	1	2.256 (0.13308) NS
	Yes (1–2 Years)	27 (45)	19 (31.7)		

Table no 2: The data of both study groups are expressed as frequency (f) and percentage in parenthesis. Study groups: Experimental group: geriatrics who underwent multimodal intervention regarding health promotion, Control group: geriatrics who did not undergo multimodal intervention. Homogeneity test: The Chi-square test was used for comparison of the demographic variables of the geriatric clients of the experimental and control groups. Level of significance: at $P \leq 0.05$ was considered significant, and $P > 0.05$ was considered non-significant

Table 3: Distribution of pre-test and post-test levels of perception

Perception grading	Perception scores	Experimental group *f* (%)			Control group f (%)		
		Pre-test	Post-test 1	Post-test 2	Pre-test	Post-test 1	Post-test 2
Poor	0–25	18 (30)	0 (0)	0 (0)	20 (33.4)	18 (30)	21 (35)
Moderate	26–50	42 (70)	46 (76.7)	34 (56.7)	37 (61.6)	42 (70)	39 (65)
Good	>51 and above	0 (0)	14 (23.3)	26 (43.3)	3 (5)	0 (0)	0 (0)
	Total	60	100	60	100	60	100

Table 4: Distribution of area-wise RFS and TFS Scores of QOL regarding health promotional outcomes among geriatric clients in the experimental and control group (*n*=60 + 60)

Area wise (QOL)	Test	Experimental Group		*P*	Control Group		*P*
		RFS	TFS		RFS	TFS	
SAB	Pre-test	8.3±2.5	27.1±16.1		11.7±4.2	48.3±26.6	
	Post-test I	13.5±1.8	59.4±11.7	0.01	9.0±2.7	31.2±16.9	0.32
	Post-test II	13.1±1.9	57.1±12.3		8.3±2.2	27.0±13.9	
ABOUT	Pre-test	9.2±3.0	32.7±19.2		7.5±1.6	21.8±10.0	
	Post-test I	10.6±2.4	41.4±15.2	0.3	7.8±2.1	24.0±13.5	0.51
	Post-test II	10.9±1.2	43.3±7.5		7.9±2.2	24.3±14.2	
PPF	Pre-test	9.3±2.8	33.5±17.7		7.8±2.1	24.1±13.4	
	Post-test I	11.4±2.0	46.6±12.5	0.7	8.5±2.3	28.3±14.9	
	Post-test II	12.7±1.1	54.5±7.1		8.6±2.3	28.9±14.4	0.43
SOP	Pre-test	7.1±1.1	19.5±7.0		8.5±2.9	28.2±18.7	
	Post-test I	11.2±2.2	45.0±14.0	0.34	8.8±2.9	30.0±18.1	
	Post-test II	12.8±1.8	55.0±11.7		8.7±2.5	29.5±16.0	
DAD	Pre-test	11.5±2.1	47.2±13.6		13.0±4.6	56.2±28.9	0.61
	Post-test I	16.2±2.0	76.6±13.0		9.8±3.5	36.4±21.9	
	Post-test II	13.5±1.9	59.5±12.2	0.03	9.5±2.9	34.5±18.3	
INT	Pre-test	9.1±2.2	31.9±14.0		8.2±2.6	26.6±16.3	
	Post-test I	11.0±1.8	44.1±11.6		8.0±2.1	25.1±13.5	0.42
	Post-test II	14.5±1.4	66.0±9.3	0.01	8.8±2.4	30.2±15.4	

#*t*-test. RFS=Raw facet score, TFS=Transformed facet scores, SD=Standard deviation, SAB=Sensory abilities, AUT=Autonomy, PPF=Present and future activities, SOP=Social participation, DAD=Death and dying, and INT=Intimacy. Study groups depict the raw facet score and transformed facet score of each aspect, the raw facet scores were obtained by summing the items belonging to a facet. Its range lies between the lowest possible and highest possible (range 4–20); whereas to obtain a transformed facet score the following transformation rule can be applied: TFS=6.25 × (RFS−4), the score ranges between 0 and 100

abilities using multimodal educational intervention and retain the participants.[24] On the initial day of recruitment, the participants were given a pre-test, followed by a multimodal intervention focusing on educational video teaching, the snake and ladder game, an informational pamphlet was shared with post-test I on the 30th day, Post-test II on the 60th day, which showed a greater significant improvement in QOL among geriatric clients on domain areas of autonomy, present, past, and future, intimacy, social interaction, and the intervention videos and pamphlets provided to geriatric clients as its narrated in Tables 3 and 4.[27]

Similarly, a range of studies emphasized physical, cognitive, and nutritional aspects in this study, holistic comprehensive health-promotion measures required for the elderly have been focused on.

A systematic review of observational studies was conducted to synthesize existing research on the relationship between older adults' perceptions of aging and their health and functioning. A systematic search was conducted of five electronic databases (ASSIA, CINAHL, IBSS, MEDLINE, and PsycINFO). Observational studies were included if they included perceptions of aging and health-related measures involving participants aged 60 years and older. A total of 28 reports met the criteria for inclusion. Perceptions were related to health and functioning across seven health domains: memory and cognitive performance, physical and physiological performance, care seeking, self-rated health, QOL, and death. All the studies reported a relationship between aging perceptions and health status, well-being, and QOL. This review highlights a need for more rigorous research to examine the relationship between older adults' aging perceptions and their health.[28]

A cross-sectional study to explore the associations between nutritional status and health-related QOL, physical activity, and sleep quality in elderly Greek adults from Greece who were free of any severe disease. Mini nutritional assessment was used to assess nutritional status; HRQoL was assessed using the Short Form Healthy Survey questionnaire; sleep quality was assessed using the Pittsburgh Sleep Quality Index; and physical activity levels were assessed via the International Physical Activity Questionnaire. A total of 3405 community-dwelling men and women, over 65 years old from 14 different Greek regions were enrolled. A total of 10.4% of the participants were classified as malnourished, while 35.6% were classified as "at risk of malnutrition." A better nutritional

status was significantly and independently associated with higher physical activity levels ($P = 0.0011$) and better QOL ($P = 0.0135$), as well as better sleep quality ($P = 0.0202$). The study highlights the interrelationships between a good nutritional status, high-quality sleep, an active lifestyle, and a good QOL.[29]

Future research should explore the feasibility of multimodal interventions within a wider diversity of older adults, including a stronger representation of multiple ethnic groups, and within different community settings, such as old age homes.

Limitations

The study was conducted among older adults between 60 and 75 years of age group. It can be conducted in community settings; another limitation of the study does not include randomization, since the vulnerable geriatric clients should benefit from intervention. Further research is needed to better understand factors that influence participants' adherence to intervention and strategies to improve the perception and QOL.

Conclusions

This study demonstrated that it was feasible and safe to deliver a multimodal intervention for community-dwelling older adults both in hospital and community settings. The geriatric population was found to be the biggest beneficiary of multimodal Intervention strategies. And researcher felt the need to incorporate geriatric wards in all specialty hospitals exclusively for geriatrics. As India is a developing country, the government needs to focus on health schemes and pension schemes, especially for the elderly and needs more emphasis on geriatric research projects.[30]

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Declaration

Ethical approval and consent to participate

To carry out the study, received Ethical approval from "The Central Ethics Committee of Sri Devaraj Urs Academy of Higher Education and Research Center, Tamaka, Kolar".

Before the recruitment of participants, patient information sheets and written informed consent were obtained in the translated regional language.

Consent to publication

The Department of the Research and Development Cell of SDUAHER has approved the permission to publish in the journal.

Data availability statement

The data sets in this study are available with the corresponding author upon reasonable request.

Authors' contributions

Designed the study and development of the study protocol with multimodal intervention. Delivered awareness through intervention, collected data, and analyzed. All the authors contributed to the study.

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The research conducted is self-funded by the investigator.

Conflicts of interest

There are no conflicts of interest.

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