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Original Article

Nursing Section

Effectiveness of Structured Teaching Programme on the Knowledge about Rehabilitation of Stroke Patients among Caregivers in a Selected Hospital, Kolkata, India

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ABSTRACT

Introduction: Stroke is a major global health problem and second leading cause of death worldwide. In India, the incidence of stroke rate has increased from 56/100,000 person to 117/100,000 person. Stroke rehabilitation is an active process and begins during acute hospitalisation. Stroke survivors may return to an active and productive lifestyle through rehabilitation.

Aim: To determine the effectiveness of Structured Teaching Programme (STP) on the knowledge about rehabilitation of stroke patients among caregivers.

Materials and Methods: A pre-experimental pre-test, post-test research design was used to conduct this study. Purposive sampling was the sampling method used to collect data from family caregivers of stroke survivors on the basis of semi-structured interview schedule. After collecting pre-test data, STP was organised for intervention of stroke rehabilitation to samples. Seven days were provided to the samples for utilising STP which was organised for 45-50 minutes through lecture, discussion and planned Audio-Visual (AV) aids. Post-test information was gathered after seven days from the day of teaching intervention. Seven days was assigned after getting expert opinions as well as to give time for implication of knowledge through practice of stroke rehabilitation. The sample characteristics were described by frequency, percentage and t-test was used to describe the difference between pre-test and post-test knowledge score. Chi-square test was also used to find out the association between knowledge of caregivers regarding stroke rehabilitations and selected demographic variables.

Results: The mean pre-test knowledge score was 9.76 and mean post-test knowledge score was 14.7. There was a statistically significant improvement in the level of knowledge regarding stroke rehabilitations among caregivers ($t_{0.001,29}$=3.659) and no association was found between pre-test knowledge level and selected demographic variables.

Conclusion: The demand of stroke rehabilitation by involving family caregivers is increasing as it will help stroke patient to improve activity of daily livings as well as decrease disability and prevent complications.

Keywords: Disability, Family caregivers, Stroke survivor

INTRODUCTION

Stroke (or cerebrovascular accident) is defined as a clinical syndrome characterised by rapidly developing signs of focal or global disturbance of cerebral functions, and may last for more than 24 hours or lead to death. Having various signs of focal or global disturbance of cerebral functions, such as severe headache, dizziness, confusion, weakness or paralysis, dribbling mouth, speech difficulties, sudden blurring of vision, stroke is classified as ischemic and hemorrhagic [1]. Variety of impairments can occur after stroke attack, such as paralysis/hemiparesis which is commonly encountered [2]. This disease may be regarded as the second leading cause of death in the world and its incidence is growing very fast [3]. In this context, Kamalakannan S et al., stated in their paper that there has been more than 100 per cent increase in incidence of stroke in low- and middle-income countries including India from 56/100,000 to 117/100,000 person during 1970-1979 and 2006-08 respectively [4]. Another study estimated that age-adjusted annual cumulative stroke incident in Kolkata in the year of 2003-2010 was 141/100000 persons [5].

A life catastrophic situation of a stroke individual is an important aspect to adapt well with the present physiological changes and/or limitations. For early adaptation, rehabilitation must focus on the right things at the right time in the right context and involve persons of importance in the environment. Evaluation of rehabilitation is needed so that the persons are able to see whether the intervention has the desired effect. Strasser DC et al., took up 46 vetarans administration rehabilitation teams. These teams included 530 rehabilitation team members from six different disciplines including medicine, nursing, physical therapy, occupational therapy, social work, speech language pathology and they treated 1688 stroke patients to carry out research work on "Team functioning and patient outcomes in stroke rehabilitation" after surveying of 50 hospitals in USA. The fundamental objective was to evaluate the relationship between rehabilitation team functioning and stroke patient outcomes [6]. Their study considered 10 measures and three among them were significantly associated with patient functional improvement ($p<0.05$), task orientation, order and organisation, and utility of quality information. Along with the team functioning, trained and qualified physiotherapist had significant role for post-stroke rehabilitation [7].

Yagura H et al., also carried out a research work at one of the inpatient rehabilitation hospitals in Japan on "Benefit of inpatient multidisciplinary rehabilitation up to one year after stroke", whose primary objective was to analyse the benefit of inpatient multidisciplinary rehabilitation up to one year after stroke by considering retrospective cohort research design [8]. It may be inferred that 70.9% of non-ambulatory patients in group I, 54.8% in group II, and 43.9% in group III is improved their walking status by this intervention. Similarly, Activity Daily Livings (ADLs) are improved in 66.7% of the totally dependent patients in group I and in

approximately 50% in groups II and III. The researcher has selected physical therapy, occupational therapy and recreational therapy as a part of rehabilitation [9].

Cost is a significant part of post-stroke rehabilitation care [10]. It is observed that after stroke there are many areas of expenditures, like medication, laboratory tests, physical therapy etc., for stroke patient's survivors [11,12]. Thus, family caregivers are needed to reduce the burden of expenditure. Promotion of knowledge about stroke rehabilitation among caregivers of stroke patients is literally essential to meet healthy life of them [13]. From the above-mentioned research work, it may be noted that there is a scope to carry out a research work in Indian context.

Considering this lacunae, the main objectives of the present study were evaluation of the effectiveness of STP, and finding out association between selected demographic variables and pre-test knowledge score about stroke rehabilitation among caregivers.

MATERIALS AND METHODS

A pre-experimental pre-test, post-test research design was used in this study. The study was conducted during September 2013 to September 2014 and the setting was selected in the NRS Medical College and Hospital, Kolkata after getting ethical permission (Ref. no: NMC/463). By using purposive sampling technique, 30 caregivers were selected based on the calculation.

$$n=\frac{z^2SD^2}{d^2}$$

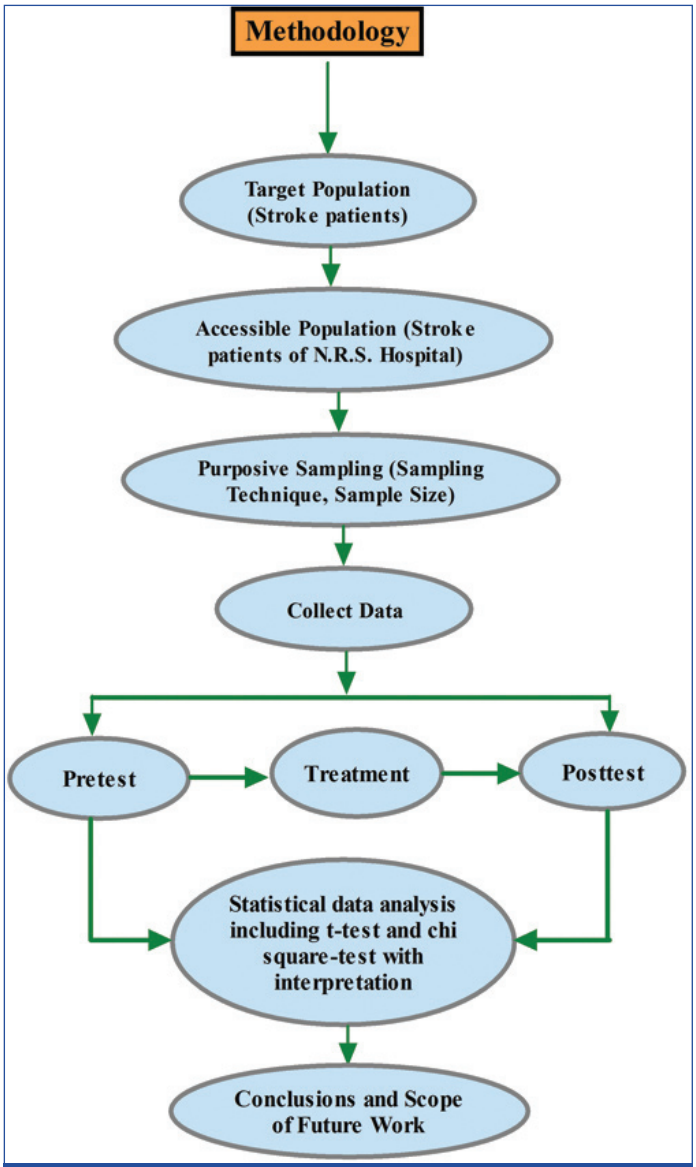
where, z=standard normal variate, which is 1.96 at 5% type 1 error, SD=standard deviation of knowledge score, d=absolute error or precision [14]. On the basis of the previous study [14], p-values are considered significant below 5%, hence, 1.96 is used in formula. Considering 95% Confidence Interval (CI) and 20% allowable error, the sample size was calculated to include 27 respondents. However, the researcher decided to include 30 unpaid family caregivers (data collection phase was completed within one month only to avoid sample mortality). The caregivers of the stroke patients were informed and explained about the objective of the study. The written informed consent dully signed individually by them was obtained. The inclusion criteria were: (i) stroke patients, having movement restriction, were selected for this study; and (ii) unpaid caregivers of stroke patient were available at the time of data collection. Paid caregivers were excluded from the study.

Demographic variables were collected in terms of age, gender, habitant, education, occupation, per capita income, total family member and marital status. A semi-structured interview questionnaire, which is attached in Annexure 1, has 18 multiple choice questions and these were classified in different areas, such as: (i) meaning of causes and effect of stroke; (ii) meaning of stroke rehabilitation; and (iii) process of physical therapy, occupational therapy, recreational therapy. The questionnaire was prepared based on the existing literatures, which were discussed in previous sections, and clinical experiences of handling of stroke patients. Each correct answer carries one mark and total score is 18. Prepared tool was validated by nine experts, out of them six were from nursing department, two were from the Department of Neurology and one was from physiology department. Split half method was adopted for reliability testing and it was found as r=0.86. Hence it was reliable. The interview process was planned to gather demographic information and the knowledge on stroke rehabilitation including home-based physiotherapy, occupational therapy and recreational therapy [15].

The STP was organised on home-based physiotherapy comprising of: (i) Take an old newspaper and try to tear that paper with affected upper limb. It will help the patient to develop strength and coordination; (ii) Hold a water bottle full or half depending upon the strength; Raise the upper limb up and down, in and out; (iii) Take a soft ball in affected upper limb and press it with finger as much as possible and roll it up and down, sideways; (iv) Place a towel on flat surface place your affected palm on it and try to grasp the towel with fingers without removing the palm from the towel. The occupational therapy consisted of process of showering, dressing, toileting, grooming, eating, and domestic or instrumental tasks, including meal preparation, shopping, skin care, mouth care and also bladder and bowel care. All the processes were selected to improve ADLs. Study also included recreational therapy to promote health and wellness through different AV aids.

Structured teaching was administered to 30 caregivers in three consecutive days for duration of 45-50 minutes approximately after the lunch time of patients depending upon the availability and level of understanding of the caregivers. After seven days from the day of teaching administration, each of caregivers was asked individually for his/her responses by interview technique based on the 18 questions. The responses, as collected, were arranged in tabular form to conduct statistical analyses, which are mentioned in the following sections.

The steps of methodology including statistical analysis are described in [Table/Fig-1] as follows:



[Table/Fig-1]: Schematic diagram on STP of stroke patient caregivers.

STATISTICAL ANALYSIS

The demographic data, collected in pre-test stage, analysis was done on nine open-ended questions in terms of frequency and percentage. The paired t-test was used to compare pre and post test knowledge scores. Chi-square test was applied to find out the association between selected variable and pre-test knowledge score.

RESULTS

Thirty unpaid family caregivers were randomly identified as sample to achieve the purpose of present study.

The demographic variables of samples are depicted in the [Table/Fig-2] which shows that the maximum (i.e. 40%) of caregivers belonged to 31-45 years of age group. It was also mentioned that equal number of male and female caregivers took participation in the study. Out of 30 caregivers, majority (i.e., 43.3%) of them was from rural area and almost 83.3% caregivers were married, 43.3% caregivers had family size of 4-5, which was maximum. Moreover in most of the cases (i.e., 43.3%) the son took participation as caregivers.

Serial no.	Demographic variable		
		Frequency	Percentage
1	**Age (Years)**		
	16-30	10	33.3
	31-45	12	40
	46-60	8	26.7
2	**Gender**		
	Male	15	50
	Female	15	50
3	**Habitant**		
	Rural	13	43.3
	Urban	9	30
	Semiurban	8	26.7
4	**Education**		
	No Formal Education	5	16.7
	Primary	0	0
	Upto Class VIII	6	20
	Upto Class XII	9	30
	Above Class XII	10	33.3
5	**Occupation**		
	Labourer	4	13.4
	Home Maker	12	40
	Service	4	13.3
	Business	6	20
	Student	4	13.3
6	**Per capita income (rupees)**		
	≤500	5	17
	501-1000	9	30
	1001-2000	7	23
	2001-4000	5	17
	4001-7000	3	10
	7001-10000	1	3
7	**Marital status**		
	Married	25	83.3
	Unmarried	5	16.7
8	**Family size**		
	≤3	7	23.3
	4-5	13	43.3
	6-7	7	23.3
	>7	3	10
9	**Relationship with patient**		
	Son	13	43.3
	Daughter	7	23.3
	Wife	8	26.7
	Others*	2	6.7

[Table/Fig-2]: Demographic variables (age, gender, habitant, education, occupation, per capita income, marital status, family size, relationship with patient (N=30).
*Others: friends and neighbours

The [Table/Fig-3] depicts that in pre-test, the knowledge score of 40% caregivers was in the range of 10-12. In the post test knowledge score, majority (i.e., 43.3%) of the samples scored between the range of 16-18 and 36.7% of them also scored within 13-15. The overall presentation showed that they scored well in the post-test as compared to that of pre-test.

Knowledge score	Pre-test		Post-test	
	Frequency	Percentage	Frequency	Percentage
1-3	1	3.3	0	0
4-6	4	13.3	1	3.3
7-9	9	30.0	0	0
10-12	12	40	5	16.7
13-15	4	13.3	11	36.7
16-18	0	0	13	43.3
Total	30	100	30	100

[Table/Fig-3]: Frequency percentage of knowledge score (N=30).

The effectiveness of structured teaching programme was analysed as follows:

H_1: Mean post-test knowledge score was significantly higher than mean pre-test knowledge score.

To find the significance of the test, null hypotheses was stated as

H_{o1}: Mean post-test knowledge score was not significantly higher than mean pre-test knowledge score

[Table/Fig-4] represented that mean post-test knowledge score i.e., 14.7, was higher compared to Pre-test knowledge score (i.e., 9.76) with mean difference of 4.94. This was suggested that there was significant improvement of knowledge due to STP. It was also observed that calculated t value (i.e., 12.97) was greater than tabulated t value (i.e., 3.659) at df 29 and 0.001 level of significance.

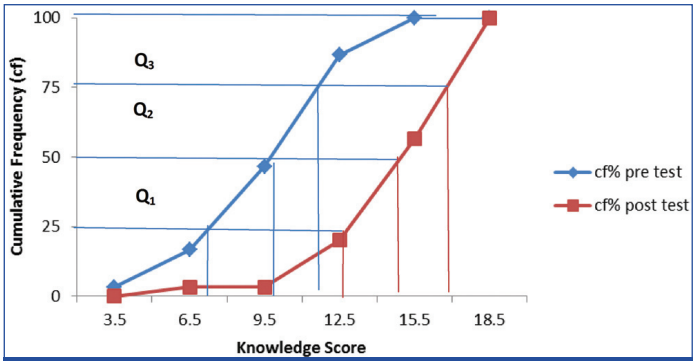
	Knowledge score	Mean	Mean difference	Median	Standard deviation	Calculated t-value	p-value
Pre-test	2-15	9.76	4.94	10	2.95	12.97	p<0.001
Post-test	11-16	14.70		15	2.64		

[Table/Fig-4]: Statistical analysis of pre-test post-test knowledge score (N=30).
t (at α=0.001 and 29 df)=3.659; df=degree of freedom

Thus, null hypothesis was rejected and alternative hypothesis was accepted, i.e., knowledge was significantly increased after STP. The data further indicated that median of post-test knowledge score (i.e., 15) was higher than that of pre-test knowledge score. A low standard deviation i.e., 2.64, in Post-test indicated that the data points were tend to be very close to the mean and a high standard deviation (i.e., 2.95) in pre-test indicated that the data points were spread out over a large range of values.

Therefore, STP was effective in terms of gain in knowledge. The effectiveness of STP was also found out by ogive as shown in the [Table/Fig-5].

The cumulative frequency percentage of pre-test and post-test knowledge score were represented in the [Table/Fig-5]. It was observed that the post-test Ogive lies on the right side of pre-test Ogive over the entire range and gap between these are wide. This was suggested that post-test knowledge score was consistently higher than that of pre-test. Comparing certain percentile points, it could also be shown the gain in knowledge for caregivers. The first quartile (i.e., Q_1) of pre-test and post knowledge score were 7.3 and 13, respectively, 2nd quartile, Q_2 of pre-test and post knowledge score were10 and 15, respectively and 3rd Quartile, Q_3 of pre-test and post knowledge score were 11.6 and 16, respectively. It was



[Table/Fig-5]: Ogive of pre-test and post-test knowledge score (N=30).
Q1=1st Quartile, Q2=2nd Quartile, Q3= 3rd Quartile

also found that Q_1, Q_2 and Q_3 of post-test were higher than pre-test. Thus, it was inferred that teaching programme was effective.

Moreover, the association between some selected demographic variables and pre-test knowledge score was calculated and shown in [Table/Fig-6]. Here, the habitant and relationship with patients are not considered as these cannot be transformed into bivariate distribution. Likewise, gender has same frequency for male and female and hence, avoided.

Sl. No.	Variable	Knowledge score		Chi² value (Calculated)	Significance at 0.05 level
		Below median	Above median		
1	**Age (Years)**			0.02	Not significant
	>40	7	5		
	≤40	10	8		
2	**Per capita income (in Rupee)**			0.78	
	>2000	4	5		
	≤2000	13	8		
3	**Education**			2.86	
	Up to xii	14	6		
	Above xii	3	7		
4	**Occupation**			0.28	
	Home makers	8	4		
	Others	9	9		
5	**Family size**			0.221	
	>4	8	5		
	≤4	9	8		
6	**Marital status**			1.74	
	Married	16	9		
	Unmarried	1	4		

[Table/Fig-6]: Association between selected demographic variables and pre-test knowledge score tabulated value (N=30). χ^2 (at α=0.05, and df=1)=3.84.
df: Degree of freedom

[Table/Fig-6] illustrats that the calculated χ^2-value was less than tabulated value at 0.05 level of significance between some demographic variables, such as age and family size and pre-test knowledge score. Hence, null hypothesis is accepted and research hypothesis was rejected. [Table/Fig-6] also illustrates that the calculated χ^2-value was less than tabulated value at 0.05 level of significance after Yates correction between rest of demographic variables, such as per capita income, education, occupation and marital status, and pre-test knowledge score. Hence, null hypothesis was accepted and research hypothesis was rejected. Thus, there was no significant association between selected demographic variables and pre-test knowledge score.

DISCUSSION

The present study illustrated one-group pre-test and post-test research design among 30 family caregivers of stroke patients in which majority of respondents were married and were in the age group of 31-45 years. Moreover, most of the caregivers were son of the patient. In another study, Jung BC et al., conducted a comparative study between control group (size 16) and experimental group (size 16) among family caregivers of stroke patients to investigate the effectiveness of rehabilitation education program in which respondents were married in the age group of 50-59 years [16]. In contrast, most of the caregivers were spouse of the patient. In continuation, it was mentioned that both research studies used t-test and chi-square test for the statistical data analysis. Moreover, the focused variations between two studies are: the present research highlighted the effect of STP in terms of knowledge of family caregivers whereas Jung BC et al., emphasised the effect of rehabilitation of educational program in terms of depression and burden of family caregivers. The t-value of present study was 12.97(p=0.001 and df=29) and the t-value of similar study was 5.11 (p=0.000, df=15 for experimental group in terms of depression and burden of family caregivers).

Other supporting study was conducted by Lee KW et al., [17]. They considered 217 despondences from different hospital setup where as we considered 30 family caregivers within one hospital setup. About 66.2% of caregivers had adequate knowledge of how to provide proper care for stroke patients compared to the present study in which correct answers were 40% in pre-test and 43.3% in post-test. However, chi-square test was used to examine association between pre-test knowledge score and the demographic variables but above-mentioned similar study used the same test for examining the differences in the responses regarding caregiving experience and caregiver training among the different hospital settings.

Another retrospective cohort study [18] considered 6737 stroke patients and their mean age was 66.9 years, whereas in present study total caregivers were 30 and mean age was 37 years. The intensity of the rehabilitation therapy was 90 days, but in the present study was based on the STP of stroke rehabilitation among caregivers for three days.

Another study [11] had focused on economic aspect of post stroke rehabilitation. In this retrospective study, author examined the economic burden of stroke from the southern Vietnam hospital. However, the present study concentrated to evaluate the effectiveness of STP on stroke rehabilitation among unpaid caregivers and data was collected through interview technique. Data was analysed by using frequency, percentage, t-test, and chi-square test. But supporting researcher collected data from sample through medical electronic device and data was analysed by standard deviation, t-test and analysis of variance (ANOVA). The results of present and supporting studies revealed that the STP on stroke rehabilitation was effective.

LIMITATION

The study was limited to sample size i.e. 30, which might be inadequate to generalise the study findings. More time duration would give more relevant results with variations of any research, but the investigator planned to complete the research work within one month to get more feasibility of getting sample and avoid sample mortality. Therefore, sufficient number of sample and time duration was required to establish the effect of STP, in general.

CONCLUSION

Stroke rehabilitation started during the patient's hospital admission depending upon medical condition of the patient, the motivation of the patient and family members, and quality of the stroke rehabilitation process. It was concluded from our study that knowledge on stroke rehabilitation was improved after administering STP among caregivers. We found that there was no association between selected demographic variables and pre-test knowledge score.

It could also be suggested that process of rehabilitation among the family caregivers of stroke patient will be benefited for the society also, as it has low cost impact for an Indian family systems.

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Annexure

Structured interview schedule on stroke rehabilitation

PURPOSE:

Structured interview schedule is developed to know the knowledge about stroke rehabilitation

INSTRUCTION:

- Each of the following questions has only one correct answer.
- Each question carries one mark.
- The investigator will ask question & put tick mark (√) against the answer given by the care giver of patient.

Choose correct answer from the following options against the statement.

1. When does stroke occur?
1.1 Circulation of blood is stopped in brain
1.2 Gas formation in stomach
1.3 Heart attack occurs

2. The reason of stroke is
2.1 High blood pressure
2.2 Smoking
2.3 Both

3. What is the main symptom of stroke?
3.1 Paralysis
3.2 Memory loss
3.3 Aphasia

4. What is the objective of stroke rehabilitation?
4.1 Improvement of independent life
4.2 Uses of different drugs
4.3 Don't know

5. What is the effect of physiotherapy?
5.1 Improvement of strength in paralysis side
5.2 Improvement in speech
5.3 Improvement in memory

6. The important treatment of stroke is
6.1 Only intake of medicine
6.2 Physiotherapy
6.3 Intravenous fluid transmission

7. When rehabilitation should be started after stroke?
7.1 6 month
7.2 3 month

7.3 As soon as possible

8. How you instruct the patient to do head exercise?

8.1 Ask the patient to flex the head only a side laterally

8.2 Ask the patient to flex the head in both side laterally, front back and rotate the head as much as possible

8.3 Ask the patient to flex the head only front and back

9. How do you instruct the patient to do back and lower limb exercise?

9.1 Ask the patient to move lower limbs up and down without bending knee

9.2 Ask the patient to point the toes downward and upward

9.3 Both

10. How will you help the patient to do upper limb exercise?

10.1 Help the patient for moving the paralysed upper limb

10.2 The patient is taught to clasp his hands together, interlacing fingers, and to lift them up into full elevation.

10.3 No idea

11. What will you do to prevent bed sore of the patient?

11.1 Place the patient in same position

11.2 Change the position two hourly and keep clean the back

11.3 Only apply soap on back

12. What will you do to prevent shoulder subluxation?

12.1 Don't pull the affected arm

12.2 Pull the affected arm

12.3 Massage the affected arm

13. Which side you will keep all daily use articles of the patient?

13.1 At right side

13.2 At affected side

13.3 At any side

14. Which is preferable for shirt of a stroke patient

14.1 Chain

14.2 Hook

14.3 Bottom

15. How you will give oral care to the patient?

15.1 Using paste and brush

15.2 Using water only

15.3 Nothing to do

16. Which measures help the patient from prevention of repetitive urination?

16.1 By offering catheterization

16.2 By offering toilet every 2 hours at day time

16.3 By offering small amount of water

17. How will you improve impaired communication?

17.1 Talking slowly by using simple words

17.2 By writing

17.3 By using gesturing, posturing

18. How you can restore good mental status of the patient?

18.1 Allow the patient only to take deep sleep

18.2 Allow the patient to sing the song, dance, drama, see news, play whatever patient likes

18.3 Allow the patient to keep silence