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Research article

A study to develop a self instructional module (SIM) based on the learning needs of the Anganwadi workers regarding malnutrition among the children below six years of age, in urban ICDS centers Agra (Uttar Pradesh)

Mr. Maneesh Kumar

Sarvapalli Radhakrishnan (SRK) University, Bhopal (M.P.), India.

Abstract

Aim: The objective is 1. To assess the learning needs of AWWs regarding malnutrition. 2. To develop a self-instructional module based on learning needs. 3. To evaluate the effectiveness of the module. **Method:** Fifty AWWs from urban ICDS centers of Agra were included as samples by purposive sampling. Data to assess the knowledge was collected by close-ended questionnaire with 50 items with maximum score of 50. The felt learning needs were assessed by open-ended questionnaire. Reliability of the questionnaire was tested by test-retest method and the tool was found to be reliable (r = 0.83). Validity was tested by consultation with guides and experts from the related field. **Results:** Area wise mean percentage was highest (68.0%) in the area 'assessment of malnutrition', it was higher (57.0%) in the area prevention of malnutrition, 41.0 in the area 'management of malnutrition' and 40.0 for the area 'factors related to malnutrition'. Total mean percentage of knowledge scores of AWWs improved from 53.2% to 97.6%. Further, area wise knowledge mean percentage improved from 40.0% in pre-test to 94.0% in post-test in the area factors related to malnutrition'. The same increased from 57.0% to 97.3% for the area prevention of malnutrition. The mean percentage for the area 'management of malnutrition' was 41.0% in pre-test which increased to 99.0% in post-test and means the percentage of the area 'assessment of malnutrition' was 68.0% in pre-test whereas it was 100.0% in post-test. Further chi-square test indicated no association between the post-test knowledge scores and demographic variables of AWWs such as age, education, refresher course attended on malnutrition among children below six years of age and number of years back refresher course attended. **Conclusion:** There was a significant association between the years of experience as an Anganwadi worker and post-test knowledge scores of AWWs.

Keywords: self instructional module, malnutrition, Agra (Uttar Pradesh).

***Corresponding author:** **Mr. Maneesh Kumar,** Sarvapalli Radhakrishnan (SRK) University, Bhopal (M.P.), India. Email: maneeshku9300@gmail.com

1. Introduction

Children constitute the most important and vulnerable segment of our population. They are truly the foundation of our nation, hence the focus of every citizen should be to promote their health and safeguard their interest. "A healthy child is a sure future" is one of the themes of WHO. Health children grow to become healthy adults, who are strong both in body and mind.

Malnutrition is an important battle to be fought and won. Pre-school children are the prime victims of malnutrition [1].

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Need for the study

Protein-energy malnutrition (PEM) is a global problem. Nearly 150 million children under 5 years in the world

and 70-80 million in India suffer from PEM, nearly 20 million in the world and 4 million in India suffer from severe forms of PEM, viz., marasmus, kwashiorkor, and marasmic kwashiorkor. Worldwide, at least 20 million children under five years of age are overweight WHO Expert Meeting on Childhood Obesity [2-4].

It is felt that being a trained professional a nurse can contribute here knowledge to help Anganwadi workers function better towards health and development of the children. Nutrition is considered to be one of the important areas to be taken care by improving knowledge of the Anganwadi workers.

Hence, the investigator felt that if a self-instructional module is developed based on the learning needs of the Anganwadi workers, it will be a good strategy to combat malnutrition among the under six-year children.

Objectives

1. Assess the learning needs of Anganwadi workers regarding malnutrition among children below six years of age.
2. Develop a self-instructional module for Anganwadi workers regarding malnutrition among children below six years of age.
3. Evaluate the effectiveness of the self-instructional module for Anganwadi workers regarding malnutrition among children below six years of age.

Hypothesis

H01– There is no significant difference between the pre-test and post-test knowledge of Anganwadi workers regarding malnutrition among children below six years

H02– There is no significant association between the demographic variables Anganwadi workers and their post-test knowledge scores regarding malnutrition among children below six years of age.

Delimitations

The study is limited to Anganwadi workers:

- Working at ICDS centers of urban Agra.
- Willing to participate in the study
- Available during data collection

2. Methodology

Research approach:

The iterative design which is one of the multi-method integrated design was used for this study to develop a SIM for Anganwadi workers on malnutrition. The quantitative method was used to assess learning needs of AWWs regarding malnutrition and quality of SIM was assessed by quasi-experimental method.

Setting:

The study was conducted at urban ICDS, Agra. Population

Sampling technique:

Purposive sampling technique was felt suitable and was used to include the Anganwadi workers of urban ICDS centers of Danvangere, as samples.

Development of tool

Part A questionnaire was prepared based on the review literature and in consultation with the subject experts. The questionnaire had three parts - Part A, Part B, and Part C. Part A included demographic variables such as age, education, year of experience, whether attended any refresher course in malnutrition of under six-year-old children and if so when was the last refresher course on malnutrition attended.

Part B was a close-ended questionnaire to assess the knowledge of the Anganwadi workers regarding malnutrition. It has four sections. Section I had five items regarding factors related to malnutrition. Section II had 30 items regarding prevention of malnutrition. Section III had five items regarding the assessment of malnutrition and Section IV had ten items management of malnutrition. Each item has one, the maximum score for the correct response. Thus, there were 50 items with 50 maximum scores.

Part C consists of an open-ended questionnaire to identify felt learning needs related to malnutrition, which were not included in Part B. The AWWs were instructed to write their felt learning needs under the following areas such as factors related to malnutrition, prevention of malnutrition, assessment of malnutrition and management of malnutrition. It did not have any score, the only percentage of responses were considered to identify the felt learning needs of Anganwadi workers related to the above-mentioned areas.

Reliability:

Reliability of the tool was tested by test-retest method. The questionnaire was administered to 14 Anganwadi workers of Agra rural, ICDS centers. The gap between the Ist and IInd test was tended days. The tool was found to be reliable (r = 0.83).

Development of SIM:

A self - instructional module was prepared based on the assessed learning needs (Table). The steps followed in the construction of the SIM were:

1. Referred related literature regarding malnutrition.
2. Prepared the contents of SIM.
3. The established content validity of the SIM.
4. Preparation of final draft of the SIM.
5. Editing and translation of the module.

1. Referred to related literature

The literature referred to prepare the content of the SIM are presented in the Annexure

2. Organization of the content of the SIM

Contents of SIM was organized into five lessons such as:

1) Nutrition
2) Diet for a child from 0-6 years of age
3) Malnutrition
4) Prevention of malnutrition
5) Management of malnourished children
6) Answer key

3. Content validity of the SIM

Content validation was established by consulting experts in related filed (Annexure). Suggestions and recommendations of the experts which were considered to modify the contents of the module are presented in table.

4. Preparation of the final draft of the SIM

The final draft of the SIM consists of five lessons namely. Lesson 1 Nutrition
Lesion 2 Diet for a child from 0-6 years of age Lesion 3 Malnutrition Lesion 4 Prevention of malnutrition Lesion 5 Management of malnourished child Annexure - answer key.

General objectives of the module are given at the beginning of the module. Each lesson has specific objectives, contents and review questions. Specific objectives were given at the beginning of the lesson, followed by the content. Review questions.

Data collection procedure

Prior permission was obtained from the Assistant Director of Women and Child Welfare Department Agra (Annexure). The researcher contacted the supervisors of the Anganwadi worker to extend co-operation. Data was collected during the monthly meeting of Anganwadi workers.
There are 89 Anganwadi centers in the urban ICDS project of Agra District. For smooth functioning the 89 Anganwadi centers, they are classified into 4 circles. Each circle constitutes 44 Anganwadi centers. Every month meetings are conducted at two AWCs. At each center meeting is conducted for two days for AWWs of two different circles. Thus, for four circles meetings are conducted in two days.
Data was collected from each circle separately during a meeting of respective circle. Thus each day data was collected from two circles and it took two days to complete the data collection procedure.
Further, a similar technique was followed for distribution of the self-instructional module and also a collection of data for post-test.
Data for pre-test was collected on 19 and 26 of October 2016, further, the module was distributed on 27th and 28th of December 2016 and data for post-test was collected on 27th and 28th of January 2017.

Data analysis

Data were analyzed by using both descriptive and inferential statistics. Mean, SD and mean percentage was used to describe the learning needs of Anganwadi workers. Further, one group pre-test (x) and post-test (y) design were used to evaluate the effectiveness (y - x) of the module.

3. Results

It is observed that the Anganwadi workers had mean knowledge score of 26.6 ± 4.1 (53.2%) out of the maximum score of 50.
Further, the level of knowledge indicates that only 38% of total scores were in excellent level and also AWWs had expressed felt learning needs regarding malnutrition in all areas of malnutrition. Hence it was felt that a module is to be prepared to improve the AWWs level of knowledge and inform them the facts regarding the self-expressed learning needs.
A self-instructional module was prepared for malnutrition. The steps followed in the development of the module is explained in Chapter III. The effectiveness of the self-instructional module was evaluated by post test for the same group with the same tool to assess the knowledge. The statistical formula used to evaluate the effectiveness of the module is described in Chapter III.
Hypotheses were tested using paired 't' test and X^2 test. Paired 't' was calculated to analyze the differences in knowledge of AWWs in the pre and post-test. The further X^2 test was calculated to analyze the associated between demographic variables and post-test knowledge scores of AWWs. (Table no 01).

Ho1:

There is no significant difference between the pre-test and post-test knowledge scores of AWWs regarding malnutrition among children below 6 years of age. Paired 't' test was calculated to analyze the difference in

knowledge of AWWs in pre-test and post-test on various areas of malnutrition.

Ho2:

There is no significant association between the demographic variables of AWWs and their knowledge scores in post-test.
Chi-square was calculated to analyze the association of demographic variables with the post-test knowledge scores of AWWs regarding malnutrition to find the effectiveness of the module with regard to demographic variables of the sample.

Table No 01: Association between demographic variables and post-test knowledge of AWWs regarding malnutrition.

Demographic variables	D.f	X^2 value	Table value	Level of significance	
Age		0.96	3.84	P > 0.05	No significance
Education		0.02	3.84	P > 0.05	No significance
Experience		0.50	3.84	P > 0.05	No significance
Attended refresher course		1.20	3.84	P > 0.05	No significance
Year of last refresher course attended		5.15	3.84	P < 0.05	Significant

4. Discussion

Worldwide the major issue of malnutrition is noted in school going Childers. It is commonly noted that Malnutrition in children pervades all aspects of their health, growth, cognitive and social development and can lead to irreversible and lifelong effects [5]. Especially in India, one of the greatest problems for undernutrition among children. Till date, even after a technical developmental phase of the country the country is still struggling with this problem. This is the only malnutrition, the condition resulting from faulty nutrition, weakens the immune system and causes significant growth and cognitive delay [6]. The present study focuses on the development of a self-instructional module (SIM) based on the learning needs of the Anganwadi workers regarding malnutrition among the children below six years of age, in urban ICDS centers Agra (Uttar Pradesh).

Chi-square values between demographic variables and the post-test knowledge scores of AWWs regarding malnutrition reveal that there was no significant associated between knowledge scores of post-test when compared to age, education, refresher course attended and year of last refresher course attended (P > 0.05). However, a significant association (P < 0.05) was observed between the years of experience of AWWs and post-test knowledge scores.
An iterative design was used to develop a SIM for Anganwadi workers regarding malnutrition based on their learning needs. Data were collected from 50 Anganwadi workers selected by purposive sampling from urban ICDS centers, Agra. Quality of SIM was assessed by quasi-experimental method.

Findings of the study are summarized as follows:

- Most (27%) of the Anganwadi workers who participated in the study were in the age group of 36 45 years old.
- 39% of the AWWs had a higher secondary education.
- A higher percentage (32%) of AWWs had 15 years of service experience.
- Most (50%) of them had attended a refresher course in malnutrition among children below 6 years of age.
- Out of 50 maximum obtainable score, the mean knowledge score of AWWs in pre-test was 26.6 ± 4.1 which was only 53.2% of the maximum obtainable score.
- The highest percentage (68%) of knowledge was observed in the area "assessment of malnutrition" and 41.0% of knowledge in the area "management of malnutrition" whereas lowest percentage (40.0%) of knowledge was in the area "factors related to malnutrition".
- Out of the five items regarding factors related to malnutrition, highest percentage (72%) of correct responses of AWWs were for the item "continuous deficient consumption of bodybuilding food is a related factor of stunted growth" and higher percentage (60%) of correct responses for the item "worm infestation is a factor related to malnutrition". In all other items percentage of correct responses were below 30%.
- From the three items regarding breastfeeding and weaning, highest percentage (96%) of correct responses was for the item "initiation of breastfeeding immediately after childbirth" whereas percentage of correct response was (30%) in the items "a child can be given solid feed at the age of 8-9 months and 10% "starting weaning at the age of 3-4 months.
- Among the six items regarding functions of different groups of food, highest percentage (94%) of correct response was for the item "cereal yield energy for body activities" (80%) of correct response for the item "egg is essential to maintain the growth of the body". In all other items percentage of correct responses were 50% above.

- Percentage of correct response was highest (88%) for the item "component of supplementary feed at AWC". A higher percentage (68%) of correct responses was for the item "fruit by purchasing them fresh". In all other items related to preservation of the nutritive value of foods, correct responses were below 60%.
- Out of the nine items regarding quantity of different foods for a 0 - 6 year old child, percentage of correct response was around 90% for both the items regarding "a child who is 4-5 years must drink one tumbler milk in a day" 90% "a child has to eat leafy vegetables every day" 72% correct response for items "a 3-4 yrs old child has to eat one egg in a day" and whereas 66% of "child who is 4-5 yrs old should eat 1-2 teaspoons of cooked leafy vegetables in a day". In all other items percentage of correct response was below 60%.
- Regarding procedure for weighing in under six year old child, almost all AWWs had knowledge on items 94% such as "hanging Salter spring scale at high level" 82% "weighing under six-year-old children once in a month" 78% AWWs had knowledge on the item "standing opposite in the scale to read the weight" and
- 74% of the AWWs responded correctly "plotting the recorded weight on the growth chart immediately". In all other items, the percentage of correct response was
- below 50%.
- In the area "assessment of malnutrition" percentage of correct response was highest (82%) for the item identification of IV grave malnutrition from growth chart', above 70% for the remaining three items on identification of malnutrition from growth charts whereas percentage of correct response was 34% the item weight recording is a measure for early identification of malnutrition".
- Out of the three items regarding care of malnourished children, the highest percentage (80%) of correct response was for the item "referral, therapeutic diet and observation for other nutritional deficiencies". In all other items percentage of correct response was below 20%.
- Regarding diet of malnourished children, out of three items, highest percentage (96%) of correct response was for the item "supplementary feed at the AWC and increased quantity of food at home". In all other items percentage of correct response was below 20%.
- Among the four items regarding health education to mothers of malnourished children and referral, highest percentage (64%) of correct response was for both the item "continue medication of the child during diet therapy" 64% of referral "referring the child when weight does not increase with diet therapy" 62% of correct response was for the item "report to center a child develops complications such as diarrhoea, vomiting or gastric distension". In other items percentage of correct response was below 10%.
- Level of knowledge showed 36% of AWWs had very poor or poor knowledge, 26% of them had good knowledge and only 38% of them had excellent knowledge.
- AWWs expressed felt learning needs in all areas of malnutrition.
- The self-instructional module was prepared to focus on all the areas whereas more importance was given to areas with poor knowledge and felt learning needs expressed by AWWs. SIM was distributed to the sample and data for post-test was collected after a month.
- The findings regarding the effectiveness of the module are summarized as follows:
- Percentile distribution of scores of AWWs in pre and post-test shows the highest difference of scores at the 75^{th} percentile and lowest difference at 25^{th} percentile.
- Mean knowledge score improved from 26.6 ± 4.1 (53.2%) in pre-test to 48.8 ± 2.0 (97.6%) in post-test.
- Highest effectiveness (58.0%) was found for the area "management of malnutrition", and a higher percentage (54.0%) for the area "factor related to malnutrition". There was 40.0% of effectiveness in the area "prevention of malnutrition" and lowest effectiveness of 32% in the area "assessment of malnutrition".
- In the area factors related to malnutrition, highest percentage (76%) of effectiveness was for the item "deficient consumption of energy-yielding food is a factor for marasmus" and higher percentage (70%) of effectiveness was for the item "continues deficient consumption of protective food is a factor of easy infection". 68% of effectiveness was for the item "dietary deficiency as an important factor of malnutrition". In all other items percentage of effectiveness was below 40%.
- Out of the three item regarding breastfeeding and weaning, 90% of effectiveness was observed for items "regarding weaning at the age of 3-4 months" 70% of effectiveness for the item "a child can be given solid foods at the age of 8-9 months" and 4% of effectiveness for the item "initiating of breastfeeding..
- In the area functions of different groups of diet, highest percentage (50%) of effectiveness was for both the item "pulses help to maintain growth of the body" 50% for the item "fruit are essential to protect body from disease" and lowest percentage (6%) of effectiveness for the item "Cereals yield energy for body activities".
- Out of five items regarding meaning of balanced diet, preservation of nutritive value of foods and components of supplementary feed at AWC, highest percentage (88%) of effectiveness was for the item "nutritive value of cereals can be preserved by washing them for minimum times", higher percentage (56%) of effectiveness was for the item meaning of balanced diet "correct combination of all groups of

food". In all other items, effectiveness was above 35%.

- Regarding the area quantity of diet for a 0-6-year-old child, 76% of effectiveness was for the item "pulses must be present in daily diet of the child" 74% of effectiveness for the item "at least one fresh fruit per day to consumed by a child" and 68% of the item "quantity of cereals needed in a day depends on age of the child" 62% of effectiveness for the item "a child of 4-5 yrs age needs 8-10 curry spoon of cereals in a day". In all other items effectiveness was below 50%.
- Percentage of effectiveness in the area procedure for weighing a child was highest (80%) was for the item "regular weight recording and adequate diet to prevent malnutrition" 60% for the item "adjusting pointer of the Salter scale to zero after placing the cradle of infant sling". No effectiveness was found for the item" hanging salter spring scale at eye level". In all other items, effectiveness was blown 60%.
- Out of five items regarding the assessment of malnutrition highest percentage (66%) of effectiveness was for the item "weight recording is a measure for early identification of malnutrition" and in all other items effectiveness was around 30%.
- Out of three items regarding care of the malnourished child, 88% of effectiveness was found for the item "diet, frequent weight assessment and referral general management of malnourished children" 86% of effectiveness was found for the item "I and II grade supplementary feed extra feed at home and observation for other nutrition deficiency. In other items effectiveness was below 30%.
- In the area diet for malnourished children, highest percentage (96%) of effectiveness was for the item "two or more sitting for a child with III or IV grade malnutrition" 84% of effectiveness was for the item "III and IV grade double quantity supplementary diet / therapeutic at AWC and increased oil/fat at home". In other items effectiveness was below 10%.
- Out of four items in the area "health education to mothers of malnourished children and referral of malnourished children, around 96% of effectiveness was for the item "health education to mothers of malnourished children to increase quantity of nutritious food at home" 38% effectiveness was for the item "report to center if child develops complication such as diarrhoea, vomiting or gastric distension". In all other items effectiveness was 40% below.
- Very highly significant ($P<0.005$) difference between pre and pot-test knowledge scores of AWWs regarding malnutrition.
- No significant association was found between post-test knowledge scores of AWWs when compared to age, education, refresher course attended and a number of years since last refresher course attended in malnutrition. A significant association ($P<0.05$) was found between post-test knowledge scores of AWWs and their years of experience.
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Conclusion

Thus, it can be that concluded there is a change in post-test knowledge scores with the change in the years of experience but there is no change in post-test knowledge scores with a change in age, education, years of experience, attended refresher course regarding malnutrition or years of last refresher course attended

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