

A Study to Develop and Evaluate a Need-based Curriculum on Nutrition for Students of Madrasahs in a Rural Block of Hooghly District, West Bengal

Nazrul Mallick¹, Indranil Saha², Rabindra Nath Sinha³, Aparajita Dasgupta⁴, Bobby Pal⁵

ABSTRACT

Introduction: Children are the hope and future for a nation. But, a large section of children is effected from malnutrition is also due to lack of knowledge and practices regarding their food requirements. So this study was conducted to design a training module to conduct more focused and need-based educational interventions.

Material and Methods: The present study was an intervention pre-post study on healthy life style among 187 Madrasahs students of class VII and VIII where intervention given to the study Madrasah with the help of need based curriculum through trained teachers where teachers were trained beforehand by the researcher himself.

Results: The mean pretest knowledge score in study Madrasah was 8.79 ± 4.15 and post test score was 24.19 ± 3.19 . The calculated t-value was 33.34 and P value was less than 0.05 with effect size 4.160 (Cohen's D). In control Madrasah the mean pretest knowledge score was 9.11 ± 4.45 and post test score was 10.78 ± 4.32 . The calculated t-value was 1.82 and P value was 0.07 with effect size 0.061 (Cohen's D).

Conclusion: This study was conducted to develop and evaluate a need-based training curriculum for madrasah students of rural West Bengal on nutritional knowledge and practices. This training curriculum was implemented by trained teachers who were. The finding of the study may provide adequate evidence to conduct more focused and need-based educational interventions to equip school students with age appropriate knowledge and practices.

Key words: Adolescent Health, Non-Communicable Disease, Unhealthy Diet

INTRODUCTION

Health is multifactorial and important factors which determine health of an individual are genetic factors, environmental factors, socioeconomic conditions and lifestyle related factors. The term 'lifestyle' means the way people live.¹ Many current-day health problems, especially in the developed countries (e.g., coronary heart disease, obesity, lung cancer, drug addiction), are associated with adoption of unhealthy lifestyles.

Malnutrition in early life has serious and long term effects because it impedes motor, sensory, cognitive, social and emotional development. The affected children likely to grow into malnourished adults are at risk of disease and early death.² There is an association between nutritional status and academic performance of students.³

Requirement of energy, protein, fat, vitamine B complex,

calcium, iron, magnesium and many nutrients are more for adolescents. But, a number of children and adolescents are not taking balanced diet due to lack of knowledge and social practices. Unhealthy dietary practices like lack of fruits and green leafy vegetables in diet, excessive intake of saturated fats, salt, sugar and packed foods are common.^{4,5}

Children are the hope and future for a nation. But, a large section of children is effected from malnutrition is also due to lack of knowledge and practices regarding their food requirements. School age is a dynamic period of growth and development as children undergo physical, mental, emotional and social changes during this stage. Malnutrition, in its various forms, is a leading health problem of today, which affect not only the childhood but also adult life. Malnutrition not only leads to stunt the physical growth but also to suboptimal intellectual development.⁶

The prevalence of obesity and overweight among children and adolescents is also in an increasing trend. Age standardized prevalence of obesity ($BMI \geq 30$) has increased by 22% from 2010 to 2014.⁷

A number of studies found that the nutritional knowledge is low in rural school children comparable to urban area^{8,9,10,11} Incorrect dietary beliefs among school girls existed in India.¹¹ So to design a training module for school students on nutritional knowledge and practices it is imperative to assess the baseline knowledge and practices of students about the common NCDs and their risk factors by

¹Assistant Professor, Department of Community Medicine, Raiganj Government Medical College and Hospital, ²Professor, Department of Community Medicine, I Q City Medical College and Hospital, ³Director-Professor & HOD, Department of Health Education and Promotion, All India Institute of Hygiene and Public Health, ⁴Director-Professor, Department of Preventive and Social Medicine, All India Institute of Hygiene and Public Health, ⁵Assistant Professor & HOD, Department of Preventive and Social Medicine, All India Institute of Hygiene and Public Health, Kolkata, India

Corresponding author: Dr Nazrul Mallick, Vil-Nandanpur, P.O-Jejur, P.S- Haripal, Dist- Hooghly, West Bengal, 712405, India

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interviewing the students. Other important stakeholders in the training need assessment are school teachers and experts in adolescent health, epidemiologist, experts in nutrition and health education who can contribute to the needs assessment and designing of training contents by providing important insights based on their expertise and experiences.¹² There are some educational intervention studies to address issues related to healthy life style among school students.^{4,5} but very few studies have been conducted among madrasah students, where majority of students belong to a particular minority community with low socio-economic status. While overall female malnutrition has been reducing over the period of time it is increasing for this community.¹³

This was a part of the study named 'a study to develop and evaluate a need-based curriculum on healthy life style for students of Madrasahs in a rural block of Hooghly district West Bengal'.

This study was conducted to develop and evaluate a need-based training curriculum for madrasah students of rural West Bengal on nutritional knowledge and practices. This training curriculum was implemented by trained teachers. The finding of the study may provide adequate evidence to conduct more focused and need-based educational interventions to equip school students with age appropriate knowledge and practices.

MATERIAL AND METHODS

It was an institution-based health educational intervention study for Madrasahs students. All students of class VII & VIII of the two selected Madrasahs (study and control) constituted the study population. Health educational intervention was undertaken in one of the two selected Madrasahs, which acted as the study madrasah and the other madrasah (without active intervention) acted as control. A total of 187 students of class VII and VIII of the two Madrasahs constituted the study population of which numbers of students (class VII & VIII) in study and control Madrasahs were 107 and 80 respectively. Exclusion criteria were students who were not willing to participate and any newly admitted student after baseline data collection.

A prospective study was conducted in five phases

1. Assessment of Training needs of Madrasah students on different aspects of healthy life-style.
2. Development of a need-based module to be used by teachers to impart training of students through classroom setting
3. Training of teachers to use the module to train students
4. Training of students by the trained teachers in classroom setting
5. Evaluation of effectiveness of the training module.

Study tools

- I) Questionnaire used for both assessment of training needs of students and effectiveness of the intervention.
- II) Curriculum for imparting training of students through trained teachers. Based on the assessment of training needs of the students this curriculum has been prepared.

Development of questionnaire

A questionnaire was developed to assess baseline knowledge & practice regarding nutrition of class VII & VIII students of the two Madrasahs. Age/ maturity appropriate knowledge and practice related to life style in terms of nutrition were assessed.

Draft Preparation

The researcher under guidance of departmental faculty and guide/ co-guide prepared a draft questionnaire in Bengali language which contained questions on background characteristics of the students and knowledge & practice of the students on Nutrition. During preparation of the draft, syllabuses of Biology/ Physical Education/ Environmental science of different boards like West Bengal Board, CBSC, ICSC, NCERT, Madrasah board etc. were consulted. Opinion/ suggestions of some senior school teachers of different boards were also collected informally.

Finalization of the questionnaire

- a) The prepared draft was sent to different experts/ stakeholders both in different departments within the institute and outside the institute for their opinion/ suggestions and validation of the contents.
- b) Taking opinion from the above mention field of experts, scientist and teachers questionnaire was revised. Then the questionnaire presented at community medicine department AIIH and PH, in presence of the experts in Community Medicine, Maternal & Child Health, Biochemistry & Nutrition, Health Education and Public Health Administration of All India Institute of Hygiene and public Health. Necessary corrections and modifications were made accordingly.

Pretesting of the questionnaire was done in another Madrasah. The questionnaire contained true/ false, yes/ no, explanation type of questions. Face validity of each item and content validity of each domain had been checked by experts in child and adolescent medicine, experts from the Department of Community Medicine of some medical college in West Bengal and the experts of different departments of AIIH & PH.

A scoring system was developed for assessment of knowledge. All questions were given same weightage. For each correct response '1' and for negative or no response '0', score was ascribed.

Methodology for development of training Curriculum

Following steps were undertaken to develop the training module-

- i) Gap analysis
- ii) Draft module preparation by researcher
- iii) Finalization of the questionnaire

Gap analysis: Difference between desired/ and existing knowledge and practice of both the study and control Madrasah students were assessed question wise, domain wise and misconception or incorrect knowledge were also assessed.

Preparation of the module: A need based module on

Questions/ Items	Study Madrasah (n=107) Correct/ Satisfactory			Control Madrasah (n=87) Correct/ Satisfactory		
	Before Intervention No (%)	After Intervention No (%)	P Value *	1 st assessment No (%)	2 nd assessment No (%)	P value*
	Concept about Balanced diet	1(0.9)	83(77.6)	< 0.05	3(3.8)	6(7.5)
Fill in the blanks- Daily diet should contain adequate amount of protein, ___ / ___ and (minerals like iron, iodine etc)	44(41.1)	90(84.1)	< 0.05	34(42.5)	35(43.7)	>0.05
Do you think regular consumption of fruits and vegetables is good for health?	102(95.3)	106(99.1)	0.12	76(95)	73(91.3)	>0.05
Explain why?	17(15.9)	92(86.0)	< 0.05	30(37.5)	32(40.0)	>0.05
What do you think regular intake of junk foods like Chowmin /egg roll or oil cake is good for health?	79(73.8)	88(82.2)	0.15	62(77.5)	60(75.0)	>0.05
Explain why?	20(18.7)	87(81.3)	< 0.05	17(21.3)	19(23.8)	>0.05
Ever heard about anaemia?	15(14)	93(86.9)	< 0.05	18(22.5)	17(21.3)	>0.05
If yes, knowledge about causes of anaemia?	2(1.9)	90(84.5)	< 0.05	6(7.5)	9(11.2)	>0.05
How anaemia can be prevented?	4(3.7)	74(69.2)	< 0.05	2(2.5)	7(3.8)	>0.05
What should be the first food of a new born?	89(85.2)	105(98.1)	< 0.05	69(86.3)	71(88.8)	>0.05
Food to be given to a 4 month old baby?	32(29.9)	94(87.9)	< 0.05	33(41.3)	31(38.8)	>0.05
After which month a baby should offered homemade semi solid food along with breast milk?	37(34.6)	89(83.2)	< 0.05	29(36.3)	29(36.2)	>0.05
Meaning of ORS?	46(43.0)	90(84.1)	< 0.05	52(65.0)	50(62.5)	>0.05
Why ORS is used?	27(25.2)	90(84.1)	< 0.05	26(32.5)	28(35.0)	>0.05
Before eating hand washing with soap should be done?	87(81.3)	102(95.3)	< 0.05	72(90.0)	70(87.5)	>0.05
After defecation hand washing with soap should be done?	84(78.5)	102(95.3)	< 0.05	69(86.2)	67(83.7)	>0.05
Before preparing food hand washing with soap should be done?	80(74.8)	102(95.3)	< 0.05	58(72.5)	59(73.7)	>0.05
Important dietary sources of Iron	10(9.3)	82(76.6)	< 0.05	9(11.2)	10(12.5)	>0.05
Important dietary sources of Calcium	14(13.1)	91(85.0)	< 0.05	9(11.2)	11(13.7)	>0.05
Important dietary sources of Iodine	1(0.9)	81(75.7)	< 0.05	2(2.5)	3(3.7)	>0.05
Important dietary sources of Vitamin A	9(8.4)	64(59.8)	< 0.05	17(21.2)	13(16.2)	>0.05
Important dietary sources of Vitamin B	10(9.3)	71(66.4)	< 0.05	11(13.7)	11(13.7)	>0.05
Important dietary sources of Vitamin C	7(6.5)	71(66.4)	< 0.05	11(13.7)	13(16.3)	>0.05
Important sources of vitamin D	9(8.4)	72(67.3)	< 0.05	9(11.2)	11(13.7)	>0.05
Iron deficiency manifestation	8(7.5)	73(68.2)	< 0.05	13(16.7)	15(18.7)	>0.05
Calcium deficiency manifestation	12(11.2)	48(44.9)	< 0.05	10(12.5)	6(7.5)	>0.05
Iodine deficiency manifestation	6(5.6)	46(43.0)	< 0.05	8(10.0)	11(13.8)	>0.05
Vitamin A deficiency manifestation	7(6.5)	46(43.0)	< 0.05	13(16.2)	15(18.7)	>0.05
Vitamin B deficiency manifestation	4(3.7)	39(36.4)	< 0.05	2(2.5)	3(3.7)	>0.05
Vitamin C deficiency manifestation	2(1.9)	37(34.6)	< 0.05	5(6.2)	7(8.7)	>0.05
Vitamin D deficiency manifestation	14(13.1)	42(39.3)	< 0.05	3(3.7)	6(7.5)	>0.05
Why anti worm tablet given from school?	12(11.2)	54(50.5)	< 0.05	13(16.2)	13(16.3)	>0.05

Table-1: Baseline knowledge regarding nutrition and change in knowledge with or without intervention among the students of the study and control Madrasahs (N=187)

* Mc Nemar Chi-square

nutrition was prepared in Bengali language by the researcher based on gap analysis under guidance of departmental faculty and guide/co-guide.

Finalization and use of the module

a) The prepared draft was sent to following group of experts/ stake-holders, both within the institute and outside the institute for their opinion/ suggestions.

- Experts in Pediatric health and adolescent medicine of medical colleges.
- Medical Officer cum In-charge of School Health AIIH & PH, Kolkata
- Faculty of the departments of Community Medicine, Maternal & Child Health, Biochemistry & Nutrition, Health Promotion & Education and Public Health Administration of AIIH & PH, Kolkata.
- Senior scientist/ Epidemiologist of National Institute of Cholera and Enteric Diseases
- Experts from the Department of Community Medicine of different medical colleges in West Bengal
- School teachers

STATISTICAL ANALYSIS

Collected data compiled on Microsoft Excel worksheet and analyzed with SPSS statistical software program (version 16) (Chicago, USA).

RESULTS

There is no statistical significant difference in back ground characteristics of the students of study and control Madrasahs except in the proportion of students in class VII and VIII and religion of students (table-1).

The mean pretest knowledge score in study Madrasah was 8.79 ± 4.15 and post test score was 24.19 ± 3.19 . The calculated t-value was 33.34 and *P* value was less than 0.05 with effect size 4.160 (Cohen's D). Practice related to mean nutrition score in pretest was 7.13 ± 1.77 and post test score was 7.84 ± 1.51 . The calculated t-value was 7.35 and *P* value

was less than 0.05 with effect size 0.430 (Cohen's D) (fig-1,2).

In control Madrasah the mean pretest knowledge score was 9.11 ± 4.45 and post test score was 10.78 ± 4.32 . The calculated t-value was 1.82 and *P* value was 0.07 with effect size 0.061

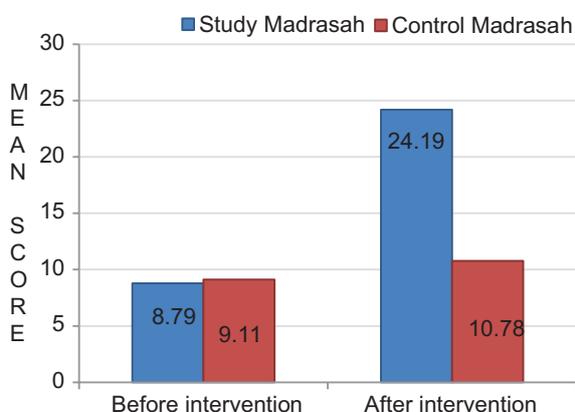


Figure-1: Bar diagram showing comparison of mean score of knowledge related to nutrition in study and control Madrasahs before and after intervention

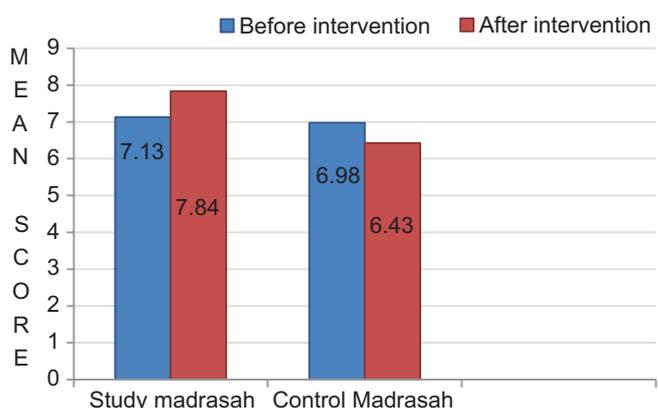


Figure-2: Bar diagram showing comparison of mean score of dietary practice in both the study and control Madrasahs before and after intervention

Questions/ Items Frequency of consuming different food groups in last week in days	Study Madrasah (n=107) Correct / Satisfactory			Control Madrasah (n=80) Correct / Satisfactory		
	Before Intervention	After Intervention	<i>P</i> value*	1 st assesment	2 nd assesment	<i>P</i> value*
	No (%)	No (%)		No (%)	No (%)	
Fruits -	57(53.3)	77(72.0)	< 0.05	31(38.7)	31(38.7)	>0.05
Vegetables -	81(75.7)	94(87.9)	< 0.05	46(57.5)	47(59.8)	>0.05
Animal protein like egg/fish/meat	48(63.6)	68(63.6)	>0.05	43(53.7)	41(51.2)	>0.05
Milk and milk products -	44(41.1)	43(40.2)	>0.05	26(32.5)	25(31.3)	>0.05
Junk food like chowmin/egg roll/oil cake -	75(70.1)	75(70.1)	>0.05	42(52.5)	39(48.7)	>0.05
Cold drinks like coca cola/pepsi -	72(67.3)	76(71.0)	0.12	51(63.8)	40(50.0)	0.01
What do you eat in school lunch last day?	81(75.7)	85(79.4)	0.12	68(85.0)	69(86.2)	>0.05
Do you eat your breakfast daily?	82(76.6)	87(81.3)	0.05	64(80.0)	60(75.0)	>0.05
Whether extra salt is added to cooked food -	42(39.3)	58(54.2)	< 0.05	35(42.5)	41(51.2)	0.04
Whether hand washing practicing before taking food -	69(64.5)	83(77.6)	< 0.05	55(68.7)	55(68.7)	>0.05
Whether hand washing with soap after defecation?	92(86.0)	93(86.9)	>0.05	69(86.2)	66(82.5)	>0.05

*Mc Nemar Chi square

Table-2: Baseline practice regarding nutrition and change in practice with or without intervention among the students of the study and control Madrasahs (N=187)

(Cohen's D). Practice related to mean nutrition score in pretest was 6.98 ± 1.68 and post test score was 6.43 ± 1.64 . The calculated t-value was -1.92 and P value was 0.06 with effect size 0.108 (Cohen's D) (table-2).

DISCUSSION

As objective of the study was to develop a need based curriculum for the Madrasahs students of class VII and VIII, thus it was imperative to assess the deficiencies in knowledge and practice of all the students of the two selected Madrasahs. Question/ item wise gap analysis between existing and desire knowledge and practice revealed the important facts.

The present study showed that, only 0.9% students in study Madrasah and 3.8% control Madrasah have knowledge about balanced diet. 44.1% students in study Madrasah and 42.4% control Madrasah have knowledge about what our daily diet should contain.

Study done by Patimah S et al¹⁴ among adolescent school girls in Maros district, South Sulawesi, Indonesia found that 59% of subjects had adequate knowledge about nutrition and in a study it is found that 23.9% of children had known the etiology of anaemia by Maiti S et al.¹⁵

A number of open ended questions incorporated into the questionnaire to get an idea of prevailing subjective opinion, beliefs and misbeliefs, misconceptions and myths on important areas related to knowledge of students. Analysis of this qualitative information's were very much help full to the researcher to design the training content affectively so that adequate stress could given to correct common beliefs and misconceptions.

In question "what do you know about Balanced diet" in study Madrasah 74.8% students did not answer anything and rest 25.2% student given incorrect answer. Some of them stated that green leafy vegetables are known as balanced diet and in a question "What do you think regular intake of junk foods like Chowmin /egg roll or oil cake is good for health- explain why" in study Madrasah 8.8% students given wrong answer. Most of them stated that it causes 'gas'. Some of them stated that consumption of junk food reduced vitamin in our body. The present study found that 16.8% students in study Madrasah and 15% in control Madrasah not used to take breakfast regularly among them 55.5% students in study Madrasah and 25% in control Madrasah did not take breakfast regularly because of time constrain.

Eating breakfast on weekdays varies substantially across countries and regions, from 92% of 11-year-old boys in the Netherlands doing so to 34% of 15-year-old girls in Albania. The largest gender differences are found in France (15-year-olds), Greenland (13-year-olds), and United Kingdom (England and Wales) (13- and 15-year-olds).¹⁶ In a similar Study among school children and adolescents found the prevalence of people who did not eat lunch meal, afternoon snack, dinner and after dinner snack was 0.1%, 2.9%, 0.1%, and 16.1%, respectively by Naeeni MM et al¹⁷

CONCLUSION

The present study was an intervention pre-post study on

healthy life style among Madrasahs students of class VII and VIII where intervention given to the study Madrasah with the help of need based curriculum through trained teachers where teachers were trained beforehand by the researcher himself.

Life-style related issues in the syllabus of school students may be covered through subjects like environmental science, life science/ biology, physical education etc. But, the present study has revealed that knowledge and practice of students of the two madrasahs in the related area of research are far from satisfactory. So, a well-designed need-based health educational intervention may play active role in bringing desired knowledge and behavior among the population group.

Behavior and life-style changes for prevention of rising incidence of NCDs are one of the stated objectives of National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular diseases and Stroke (NPCDCS). Based on findings of current study it can be stated that there is a strong need to consider these adolescent health related issues more seriously and give more stress to develop and implement school-based educational interventions tailor-made with the age and maturity of the students that can be implemented through trained teachers.

Finally, for better sustainability of the effects it is recommended that regular teachers training courses (B.Ed / M.Ed etc.) should incorporate these issues in their regular training programme.

A few more practical sessions, like demonstration of methods of measuring one's weight/ height etc. and calculation of own BMI status were necessary to make the teaching-learning sessions more interesting and effective. Due to lack time this second post evaluation could not be conducted

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