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Generating Awareness for Different Therapeutic Diets in Rural Bulandshahr, Uttar Pradesh: Application of Difference in Differences Method

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A B S T R A C T

Non communicable diseases are the major issues which needs to be identified in terms of prevalence, health hazards, lifestyle change, unbalanced diet, physical disparity, physiological and mental changes and unawareness etc. This has resulted into the adverse effect on human health. Incidences of hypertension, type II diabetes, osteoporosis and gout/ arthiritis have been elevated by 18.2 per cent since last decade in India. The study was conducted to precisely estimate the effect of trainings imparted to 100 rural women with respect to different parameters of environment, different non communicable diseases and therapeutic diets with respect to them. The methodology used in finding out the output was "difference in differences" method. For the purpose 100 women farmers were also sampled as control group. The study is considered as random controlled trial. The pre training mean score of treatment (PrTMS-T) group on their overall awareness about different parameters of environment, therapeutic diets, different ailments and there dietary management was 1.18 which increased to 1.88 in post- training survey (PoTMS-T) and it was found to be very effective with mean score of main effect of training (MSMET) 0.74 over control. It was concluded from the study that well defined training programmes shall definitely bring a major transformation in awareness level of rural women. Moreover, the methodology used also got validated in the study which opened a new option for the extension researchers to precisely estimate the effect of any planned intervention.

Introduction

Human brain is advancing, highest technologies in every sphere of life is proving it. "We are what we eat", is an old saying, which perceives the significance of food which is consumed. Lack of awareness is very prominent when it comes to food security and

persisting beliefs of traditional knowledge is making it even narrower (Antonio and Jagjit, 2017).

Rakely supervised nutritional program and inappropriate public food dispersion system are the unhidden factors hindering food security of India (Prakash and Palanivel, 2011).

Unawareness related to food is causing serious health issues in young children. Stunted growth, malnutrition and micronutrient deficiency diseases are prevailing abruptly (Manpreet and Amitha, 2008).

All the stakeholders such as government, scientists, concerned people at home should be nutritionally educated so that access to nutritious diets, clean environment and healthy lifestyle should be promoted (Gopalan, 2013).

It is evident that modifications of diets in different ailments like diabetes, hypertension, gout, osteoarthritis etc. prepositioned a major impact in human life. Better dietary knowledge, perception and improvised package leads to better understanding and control of diseases (Waqas Sami, 2017).

Edward, 2017 in his study concluded that there is a significant difference in dietary pattern of rural and urban population of India. There is an increase in total energy intake and salt consumption. Urban population is much on the verge of becoming obese, hypertensive and other diseases. Research suggested that there is supposed to be detrimental effects on overall health in concordance with dietary changes in India.

A therapeutic diet is usually moderation of regular diet. Usually modifications are inculcated in nutrients taking in consideration of disease pertaining. National Institute of Nutrition says that clinical management is possible with therapeutic diets. Focus is laid on underlying conditions of patients history, existing symptoms and present condition of the patient.

Nutrition sensing and absorption of energy plays vital role in improving quality of life, it also controls ageing and life expectancy. Diets comparatively low in fats, high in fiber too mark their presence in upbringing greater life expectancy and combating illness (Sridhar, 2015).

Awareness generation programme does create the change in perception of people towards different diseases. Ankit Chandra *et al.*, (2016) in his study concluded that the intervention of such awareness programs increases the knowledge upto 62.8%, though there was a devaluation in the viewpoint and the interest of the people towards alleviating care of HIV/ AIDS patients.

Awareness is very low regarding the prevention, control and treatment of different therapeutic diseases. Even the people are not aware about the existing illness. In one study of 731864 individuals, 76.1% were screened in which 44.7% were aware of diagnosis and 13.3% were treated and only 7.9% achieved control on the illness (Prenissl, *et al.,* 2019). Difference in differences design can be used as public health policy research tool. It is a quasi- experimental design and represents a feasible tool to acquire more about causal relationship. It removes the space and time biasness between the two groups tested in two different times. It can be used in applied sciences to validate the assumptions (Coady Wing *et al.,* 2018).

Materials and Methods

The present study was conducted in rural arena of Bulandshahr district which is located in western Uttar Pradesh. Total of 200 rural

females of age group 20- 40 years were randomly selected exclusive the criteria of education. Two groups namely treatment group and control group were made including 100 females in each group. In both the groups, again four groups of 25 females were made.

These small groups were made purposely so that, imparting training would be easy and comfortable and interaction could be made convenient. A non- prompted questionnaire was prepared to ask the questions regarding climate change and therapeutic diets, different components of hypertension, type II diabetes, osteoporosis and gout/ arthritis.

Pre training survey was conducted in July 2019 and questions were asked regarding awareness of different parameters of therapeutic diets. Again, in November 2019 post training survey was carried out and same questions were taken into consideration. The score was calculated on 3 continuums i.e. most knowledgeable, moderately knowledgeable and unknowledgeable in pre survey. In post survey again 3 continuums were proclaimed namely most acquired/ moderately acquired and unacquired.

As the training needs should also be prioritized so to give them consolidated score frequency of the respondents was multiplies with their respective continuum score and summation was done afterwards. Mean score of pre- training and post- training was calculated and then subtracted for treatment and control group.

To find out main effect of the training again, subtraction was conducted between already subtracted mean scores of pre- and post-trainings of both treatment and control groups. Paired t- test of two sample means was carried out to see the significant difference in pre- and post-training of both the groups. The methodology used was Difference in differences (Zhou, *et al.*, 2016, Kirti *et al.*, 2020) which makes the design so appropriate to find out the differential effect of the training imparted. It is a strong analytical tool which proved to be helpful in removing time and space biases. This tool minimises the effect of extraneous variables.

Results and Discussion

In the procedure of transmitting trainings on different topics of awareness it was found that women were very much affected by social restraints like food is just food and it is consumed to fulfil the hunger. Myths pursuing in rural areas were limiting the respondents to accept the different certitudes related to different diseases and their dietary treatment.

In the post- training survey, it was assessed that extent of acquaintance, knowledge and awareness was enhanced among respondents.

Climate change and therapeutic diets are the most significant domain wherein rural women require meticulous awareness through training subjection for their cognitive enhancement.

Second most emphasised areas are different components of hypertension followed by diabetes followed by osteoporosis, emerging out due to change in lifestyle even at rural level wherein rural women require comprehension backstopping. Different components of gout/ arthritis and the dietary management did not appear as the notable sector.

Therefore, to sustain the knowledge of rural women, deliberate awareness is needed. Total awareness score and mean score were calculated with a purpose that further tutoring is required in some areas like awareness about global warming, hypertension and its causes followed by type II diabetes and its causes, osteoporosis and its causes further followed by gout/ arthritis as a whole topic.

Table.1 Overall effect of training on different parameters

Sl. No.	Awareness about	Total acquisition Score (TAS)	Treatment group		Control group		Main effect of the training (B-A) -(D-C) (MSMET)	t-value
			Pre-training MS (A) (PreTMST)	Post-training MS (B) (PostTMST)	Before training MS (C) (PreTMSC)	After training MS (D) (PreTMSC)		
a)	Environment and Therapeutic diets	424	1.10	2.07	1.09	1.17	0.92	2.39*
b)	Hypertension	375	1.26	2.14	1.22	1.30	0.80	2.11**
c)	Type II Diabetes	373	1.21	1.94	1.21	1.28	0.66	1.84**
d)	Osteoporosis	372	1.16	1.18	1.16	1.21	0.61	1.70**
e)	Gout/Arthritis	284	1.11	1.65	1.11	1.16	0.47	1.16^{NS}
f)	Malnutrition	431	1.25	2.27	1.22	1.29	0.97	2.53*
	Average	377	1.18	1.88	1.16	1.24	0.74	2.03**

*significant at p<0.01, **significant at p<0.05

Overall effect of training intervention: Table 1 on overall effect of training depicted that awareness on different parameters of malnutrition (MSMET 0.97) and environment and therapeutic diets (MSMET 0.92) were found to be most significant (p>0.01) in terms of knowledge acquisition. Cognizance about hypertension (MSMET 0.80), type ii diabetes (MSMET 0.66) followed by osteoporosis were also found to be significant (p>0.05). The PrTMS-T of diet modification in different weather was 1.11 which was already low in comparison of other topics. The PoTMS-T of same was recorded as 1.65 but as the respondents did not acquire much knowledge in related parameters so the results reflected as non-significant (MSMET 1.16).

Table.2 Effect of training on different components of environment and therapeutic diets

Sl. No.	Awareness about	Total acquisition Score (TAS)	Treatment group		Control group		Main effect of the training (B-A) -(D-C)	t-value
			Pre-training MS (A)	Post-training MS (B)	Before training MS (C)	After training MS (D)		
a)	Environment	415(IV)	1.00	1.85	1.01	1.08	0.78	1.93**
b)	Global Warming	404(V)	1.12	1.76	1.10	1.14	0.60	1.53^{NS}
c)	Pollution	421(III)	1.04	2.00	1.02	1.12	0.86	2.36*
d)	Balanced Diets	436(II)	1.12	2.25	1.14	1.21	1.06	2.51*
e)	Therapeutic diets	444(I)	1.23	2.62	1.20	1.31	1.28	2.63*
	Average	424	1.10	2.10	1.09	1.17	0.92	2.39*

*significant at p<0.01, **significant at p<0.05

Table 3 demonstrated the effect of training on different components of environment and therapeutic diets. Awareness on environment, global warming, pollution, balanced diets and therapeutic diets was generated among rural women. Awareness acquainted about therapeutic diets was found to be maximum with MSMET 1.28. Balanced diets and its effect on health were perceived on second position followed by pollution and environment with MSMET 1.06, 0.86 and 0.78 respectively. They were found to be significant p>0.01at 199 df except environment which was found significant at p>0.05. Awareness on global warming was observed to be non-significant. Global warming was least acquainted topic as we can see that PrTMS-T was1.12 which was quite low and PoTMS-T, increased to 1.76 and it needs to be taken into consideration again.

Table.3 Effect of training on different components of Hypertension

Sl. No.	Awareness about	Total acquisition Score (TAS)	Treatment group		Control group		Main effect of the training (B-A) -(D-C)	t-value
			Pre-training MS (A)	Post-training MS (B)	Before training MS (C)	After training MS (D)		
a)	Hypertension	357	1.31	1.91	1.11	1.23	.48	1.04^{NS}
b)	Foods avoided in Hypertension	376	1.32	2.42	1.30	1.39	1.01	2.46*
c)	Causes of Hypertension	320	1.26	1.76	1.28	1.34	0.44	1.01^{NS}
d)	Therapeutic diet in hypertension	362	1.11	1.94	1.14	1.21	0.76	2.13**
e)	Importance of physical activities	462	1.28	2.68	1.26	1.30	1.36	2.83*
	Average	375	1.26	2.14	1.22	1.29	0.81	2.11**

*significant at p<0.01, **significant at p<0.05

Effect on training on different components of hypertension was found to be significant with MSMET 0.81, p>0.05 at 199 df. Importance of physical activities and related parameters like types of activities etc. were well accepted with MSMET 1.36. Knowledge about foods to be avoided in hypertension and its recommended daily allowances was also properly acquired by respondents (MSMET 1.01). Respondents were already had little acquaintance about therapeutic diet in hypertension, timings of meals and interval between two meals hypertension etc. The PrTMS-T was recorded as 1.11 and later as 1.94. Knowledge for hypertension and its related terminology, its various causing factors and maintenance was established as non-significant and this topic need to be emphasised again (Table 3).

Table.4 Effect of training on different components of Type II Diabetes

Sl. No.	Awareness about	Total acquisition Score (TAS)	Treatment group		Control group		Main effect of the training (B-A) -(D-C)	t-value
			Pre-training MS (A)	Post-training MS (B)	Before training MS (C)	After training MS (D)		
a)	Type II Diabetes	366	1.19	1.84	1.20	1.29	0.56	1.27^{NS}
b)	Causes of Type II Diabetes	291	1.09	1.50	1.11	1.17	0.35	1.02^{NS}
c)	Foods to be avoided in Type II Diabetes	401	1.26	2.11	1.27	1.32	0.80	2.17**
d)	Therapeutic diet in Type II Diabetes	432	1.17	2.21	1.19	1.25	0.98	2.39*
e)	Importance of physical activities	377	1.32	2.02	1.27	1.38	0.59	1.33**
	Average	373	1.21	1.94	1.21	1.28	0.66	1.84**

*significant at p<0.01, **significant at p<0.05

Table 8 depicted effect of training on different components of type II diabetes. Rural generation got more aware about the modifications in diet to be made in the topic therefore most of the results were recorded as significant (p>0.01). Awareness on foods inclusion and exclusionand importance of physical activities was acquired proficiently thus results came significant (p>0.05). The science behind reasons of occurance of diabetes and physiological changes were still not well acquainted thus the results portrayed as non-significant. The overall extent of awareness was significant (p>0.05) as can be evident(MSMET- 0.66).

Table.5 Effect of training on different components of Osteoporosis

Sl. No.	Awareness about	Total acquisition Score (TAS)	Treatment group		Control group		Main effect of the training (B-A) -(D-C)	t-value
			Pre-training MS (A)	Post-training MS (B)	Before training MS (C)	After training MS (D)		
a)	Osteoporosis	301	1.19	1.46	1.20	1.24	0.23	0.92^{NS}
b)	Causes of osteoporosis	342	1.14	1.74	1.13	1.16	0.57	1.23^{NS}
c)	Foods to be included in osteoporosis	435	1.19	2.15	1.20	1.25	0.91	2.43*
d)	Therapeutic diet in osteoporosis	372	1.15	1.85	1.17	1.23	0.64	1.72**
e)	Importance of physical activities	411	1.12	1.86	1.10	1.16	0.68	1.81**
	Average	372	1.16	1.81	1.16	1.21	0.61	1.70**

*significant at $p<0.01$, **significant at $p<0.05$

Awareness about food sources and precautions regarding the dietary management was critically accepted by respondents with MSMET 0.91. Women usually had misconception about the symptoms of osteoporosis and coincide the osteoporosis with gout/ arthiritis. So during the awareness generation session clarity on the point was made. Although, the scientific concept of topic and its causing factors was not really clear to them (statistically found non-significant). Awareness generation about therapeutic diet and importance of physical activities in osteoporosis was identified as significant $p>0.05$(Table 6).

Table.6 Effect of training on different components of Gout/Arthritis

Sl. No.	Awareness about	Total acquisition Score (TAS)	Treatment group		Control group		Main effect of the training (B-A) -(D-C)	t-value
			Pre-training MS (A)	Post-training MS (B)	Before training MS (C)	After training MS (D)		
a)	Gout/ Arthritis	231	1.26	1.48	1.32	1.39	0.15	0.83^{NS}
b)	Causes of Gout/ Arthritis	246	1.32	1.55	1.26	1.27	0.22	0.85^{NS}
c)	Foods to be included and avoided	295	1.28	1.78	1.24	1.29	0.5	1.02**
d)	Therapeutic diet in Gout/ Arthritis	215	1.15	1.28	1.16	1.17	0.12	0.72^{NS}
e)	Importance of physical activities	298	1.11	1.63	1.13	1.15	0.5	1.05**
	Average	257	1.22	1.52	1.22	1.25	0.30	0.94^{NS}

*significant at p<0.01, **significant at p<0.05

Awareness about different components of gout/arthiritis and its different aspects was found to be non-significant. During study it was seen that topic above was found to be little strenuous in terms of awareness generation. Women were initially less aware about the topic. Foods to be consumed and avoided and importance of physical activities in the subject were established most significant and

well acquired by the respondents with MET 0.50 respectively. The PrTMS-T of therapeutic diet was 1.15 and after training it was 1.28 which was relatively very less in terms of awareness generation. Therefore, few of the most important aspect of gout/arthiritis were identified as non-significant. Further backstopping is essential in these 3 topics (Table 5).

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