

## Full Length Research Article

### A STUDY ON THE SOCIO DEMOGRAPHIC PROFILE , NUTRITIONAL STATUS, DIETARY PATTERN AND IMPACT OF NUTRITION EDUCATION PROGRAMME ON TRANSWOMEN RESIDING IN KANCHEEPURAM AND THIRUVALLUR DISTRICTS, TAMIL NADU, INDIA

\*<sup>1</sup>Vinodha Evangeline, J. and <sup>2</sup>Dr. Annette Beatrice

<sup>1</sup>M.sc., Food Service Management and Dietetics, Department of Home Science, Women's Christian college, Chennai

<sup>2</sup>Associate Professor, Department of Home Science, Women's Christian College, Chennai

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#### ABSTRACT

**Background:** Transwomen usually they face problems like deprivation, lack of nutritious meal, lack of awareness about importance of balanced diet, and thereby they are prone to many non communicable diseases. There is inadequate research in India about the health aspects among the transgender community. Hence, it is necessary to study about their consumption pattern in detail and create awareness through nutrition program to overcome wide scale nutritional ignorance among them.

**Aims & Objective:** The present study is used to elicit socio demographic profile and to assess the nutritional status using anthropometric measurements and dietary pattern using a 24 hour recall method. To conduct and assess the impact of the nutrition education program using a pretest and post test questionnaire.

**Material & Methods:** This experimental research was carried out on hundred transwomen, between 20 and 60 years of age residing in Kancheepuram and Thiruvallur districts using an interview schedule. Anthropometric measurements such as height, body weight, Body Mass Index (BMI), body fat percentage were assessed and their dietary practices was analysed using a 24 hour recall method and the data were calculated and validated using Annapurna diet software. Pamphlets, flex and recipe booklets were prepared and used as tools for nutrition education programme. Pre test and post test questionnaire were used to assess the impact of the nutrition education programme.

**Results:** Ninety six percent of the transwomen were non vegetarians, and only 3 percent were vegetarians. The mean height of the transwomen is 164.85±6.24 cm, the mean body weight is 72.61±15.6 kg which is above than the normal reference weight and the mean daily energy intake is 1906 k cal/day. Carbohydrates constitute about 271.5 g, protein intake is 58.9g and fat intake is 64.7 g which is thrice that of the Recommended Dietary Allowances (RDA).

**Conclusion:** Nutrition education program should be conducted periodically to improve their health status, dietary practices and to overcome wide scale nutritional ignorance among them.

**Key words:** Transwomen, balanced diet, RDA, BMI

#### INTRODUCTION

The term “transgender” is used as an umbrella to describe people who “have gender identities, expressions or behaviors not traditionally associated with their birth sex” (1). As per 2011 census, India is estimated to have 4.88 lakh transgender populations. In Tamil Nadu the population is approximately 60,000 (2). According to the voter's count, transgender population in Kancheepuram district is 349 and in Thiruvallur district it is 474. Transwomen (Male to Female person) are called as “Hijra” in India and it has been substituted locally as “Aravaani” in Tamil nadu before 1990's. As a sign of acceptance and honour, the term “Aravaani” has been

reframed as “Thirunagai” in the districts of Tamil nadu. In general Transgender mainly involve three ways for their earnings such as begging in local trains and in public place, prostitution, and singing songs. Four modifiable health risk behaviors such as lack of physical activity, poor nutrition, tobacco use, and excessive alcohol consumption are the most common problem among transgender and this leads to other consequences like heart diseases, diabetes and hypertension. They have poor hygiene and sanitation practice which is the major risk factor for most of the diseases. They usually depend on unhealthy foods, junk foods and street foods since they lack in basic amenities to prepare healthy and nutritious food which results in non communicable diseases among them. Nutrition education program will help them to eat a more healthful diet, teaching good eating habits and changing social norms to make it healthy.

\*Corresponding author: Vinodha Evangeline, J.

M.sc., Food Service Management and Dietetics, Department of Home Science, Women's Christian college, Chennai

## Aims and Objectives

- To elicit information regarding the socio-demographic profile, life style pattern, dietary practices, and food consumption pattern of Transwomen in Kancheepuram and Thiruvallur Districts using an Interview schedule.
- To assess the nutritional status using anthropometric measurements such as height, body weight and body fat and to assess the dietary pattern using a 24 hour recall method.
- To conduct and assess the knowledge, awareness and practice on nutrition and assess the impact of the program before and after the conduct of the program using a pretest and post test questionnaire.

## MATERIALS AND METHODS

This study is an experimental research in which hundred transwomen, between 20 and 60 years of age residing in Kancheepuram and Thiruvallur districts were selected for the study. An interview schedule was prepared, standardized and validated and was used to collect information pertaining to the demographic profile, socio economic status, eating disorders, and dietary pattern. Interview schedule was prepared in English and the samples were personally interviewed in local language. The nutritional status of transwomen was determined using anthropometric measurements and dietary parameters. A standard stadiometer was used to measure the height of the transwomen. The subject is made to stand straight without shoes, heels together and looking straight ahead and the height was recorded to the nearest 0.5 centimeter. The body weight of the transwomen is measured using a portable weighing scale and the weight was recorded to the nearest 0.5 kg. The dietary pattern of the subjects was assessed using food frequency and 24 hour dietary recall method for three non consecutive days (2 week days and 1 weekend) and the nutrient intake of the subjects was calculated using Anna Porna diet software. Nutrition education program was conducted on balanced diet, healthy eating pattern and avoiding junk foods. Audiovisual aids such as charts, booklet, and pamphlet was prepared and distributed to the transwomen. Low cost recipes such as salads and sandwiches were demonstrated. Pre test and post test questionnaire was used to assess the impact of the nutrition education programme. Statistical analysis of mean and standard deviation was used and 't' test was used to find out the significance of the nutrition education programme. The study was approved by the Institutional Ethics Committee.

## RESULTS

Table 1 summarizes the socio demographic profile of the transwomen. Out of hundred transwomen, twenty three percent of the transwomen belong to the age group 25 –35 years, 20 percent belong to 35 to 40 years and only three percent are above 50 years of age. Table 2 summarizes that majority (86%) of the transwomen are involved in begging and collection at highways, roadways and railways. Six percent of the transwomen are social workers, and three percent of the transwomen are Dancers. Only one person is not working and she is considered as head of the family. She stays at home and manages the household activities such as cooking

and maintenance of accounts. Two percent of the transwomen are employed in post office and as a tailor in Export Company.

**Table 1. Percentage Distribution of Transwomen According to Age**

Age	Number	Percent
20-25	18	18.0
25-30	23	23.0
30-35	23	23.0
35-40	20	20.0
40-45	5	5.0
45-50	8	8.0
Above 50	3	3.0

**Table 2. Percentage Distribution of Transwomen According to their Occupation and Educational Qualification**

Occupation	Number	Percent
Collection at Highways, Roadways & Railways	86	86.0
Social work	6	6.0
Dancer	3	3.0
Sex work	2	2.0
Job – Post office, Tailor	2	2.0
Not working	1	1.0
Educational Qualification		
Illiterate	6	6.0
Primary School	54	54.0
Higher Secondary	18	18.0
Graduate	22	22.0

**Table 3. Mean Anthropometric Measurements of the transwomen**

Anthropometric measurements	Mean ± SD	Reference value for women
Height(cm)	164.85±6.24	-
Body Weight(kg)	72.61±15.6	55
BMI(kg/m <sup>2</sup> )	26.73±5.8	18 – 25
Body Fat Percentage	29.53±7.32	20-25%

Two percent openly confessed that they are sex workers. Majority (54%) of the transwomen has done primary school education, 18 percent have done higher secondary education and 22 percent of the transwomen have obtained their degree. Six percent of the transwomen are illiterates. The mean height of the transwomen is 164.85±6.24 cm, mean body weight of transwomen is 72.61±15.6 kg which is above than the normal reference weight for women given by NIN (2010) (3). The mean BMI of the transwomen is found to be 26.73±5.8. They fall under the overweight category the body fat percentage is above the normal range as given by WHO (2004) (4), and the mean body fat percentage of the transwomen is 29.53±7.32 the body fat percentage is above the normal range as given by (5) Peele (2010) which is above normal range. (Table 3) Figure 1 shows the mean anthropometric measurements of transwomen. Table 4 summarizes that ninety six percent of the transwomen are non vegetarians, and only three percent of the transwomen are vegetarians.

**Table 4. Percentage Distribution of Transwomen According to the Dietary Habits**

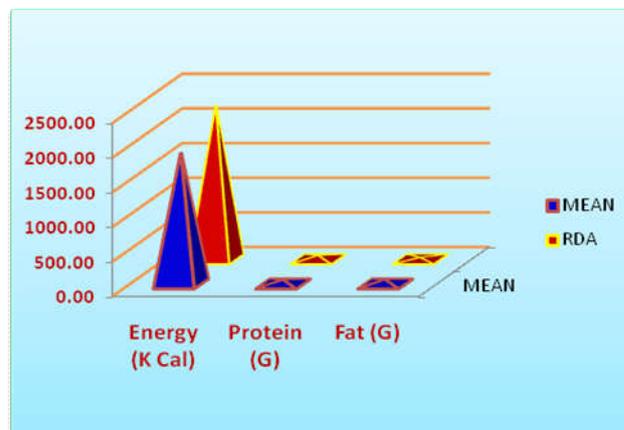
Dietary Habit	Number	Percent
Vegetarian	3	3.0
Non-Vegetarian	96	96.0
Vegan	0	0
Lacto-Vegetarian	0	0
Ovo-Lacto Vegetarian	1	1.0

Table 5 shows that mean daily energy intake is 1906 k cal/day. Carbohydrates are the major source of energy and it constitutes 271.5 g and protein intake (58.9g) is within the recommended levels. Fat intake is 64.7 g which is thrice that of the RDA. The fat is distributed as Saturated fat (32g), MUFA (23g) and PUFA (9.9g) and the mean cholesterol intake is 170.32g. With regard to the vitamins, the micro nutrients such as Carotene (3.53mg), Vitamin A (0.9657 mg), Vitamin B6 (0.2229mg), Folic acid (0.1889mg), Vitamin B12 (0.0032mg), Potassium (1585.6mg) and Zinc (6.81mg) are consumed far below than the recommended levels.

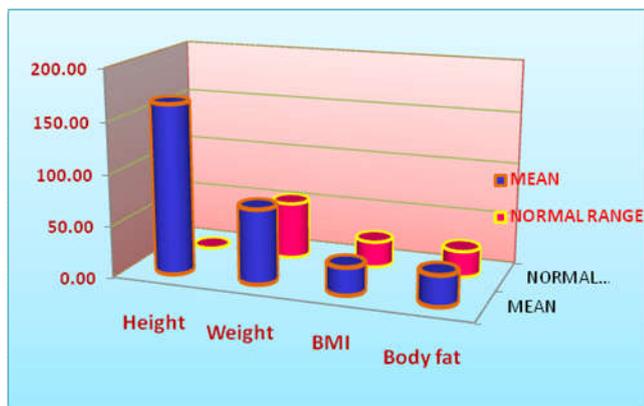
**Table 5. Mean Nutrient Intake of the Transwomen**

Nutrients	Mean ± SD	RDA
Energy (k cal)	1906.16±321.7	2230
Protein (g)	58.98±13.3	55
Fat (g)	64.77±15.7	25
Carbohydrate (g)	271.52±44.3	-
Dietary Fibre (g)	25.01±6.6	25
SF Acid (mg)	32.0±11279.42	-
MUFA (mg)	23±5715.9	-
PUFA (mg)	9.9±2361.05	-
Cholesterol (mg)	170.32±192.3	200
Vitamin A (mg)	0.9657±1.02	600
Thiamin (mg)	1.586±.487	1.1
Riboflavin (mg)	1.022±.293	1.3
Niacin (mg)	16.19±5.00	14
VitaminB6 (mg)	0.2229±.126	2.0
Folic Acid (mg)	0.1889±.1156	200
Vitamin B12 (mg)	0.0032±.0022	1.0
Vitamin C (mg)	87.26±81.27	40
Calcium (mg)	541.11±278.90	600
Phosphorus (mg)	1242.44±299.01	700
Sodium (mg)	3330.91±1024.47	2,300
Iron (mg)	17.13±3.27	21
Potassium (mg)	1585.62±379.46	4,700
Magnesium (mg)	514.80±110.12	310
Zinc (mg)	6.81±1.59	10

good improvement seen in the knowledge, attitude and practice such as balanced diet, limiting the intake of fried foods, and hygiene and sanitation standards after the conduct of the nutrition education programme. There is a significant difference between pre test and post test questionnaire. Figure 3 shows the graphical presentation of the mean scores of pre test and post test.



**Fig. 2. Mean Intake of Macro Nutrients Among Transwomen**



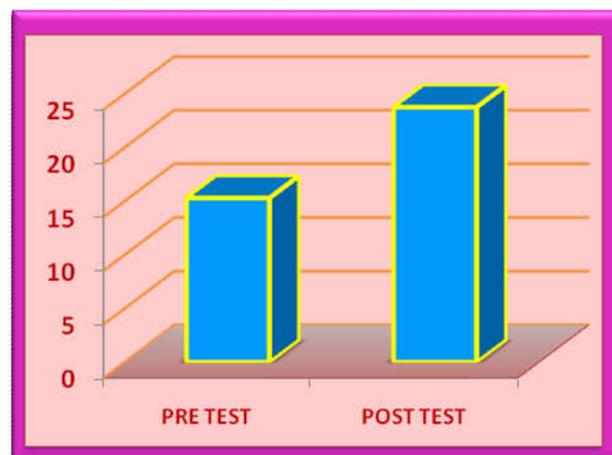
**Fig. 1. Mean Anthropometric Measurements of Transwomen**

**Table 6. Comparison of mean of pre test and post test scores**

Test	Mean ± SD	t' value	Level of significance
Pre test	15.3±3.36	26.40	0.00*
Post test	23.75±2.66		

\*Significant

The mean calcium intake is 541.11g and the mean iron intake is 17.31mg which are lesser than the recommended levels. Figure 2 shows the mean intake of macro nutrients among transwomen. Table 6 indicated that the nutrition education programme had an impact over the transwomen. There was a



**Fig. 3. The mean score of the transwomen before and after the conduct of the nutrition education programme**

**DISCUSSIONS**

The present study reveals that percentage decreases as age increases. The reason could be that transwomen are at high risk for the suicidal behaviour. Transwomen life expectancy is low when compared to the normal population since they have been exposed to psychic and physical trauma due to sex reassignment surgery. The pressing need of the transgender community is employment based on their educational qualification. Some of the transwomen shared their emotions that they involve in less qualified and immoral jobs, since they have been forced by the society for their survival. The dietary pattern of the transwomen may not be the same as the normal individuals since they are exposed to rejection, lack of attention and deprived by the society and family members, leading to skipping meals and eating foods high in fats and transfats leading to malnutrition and chronic diseases. Increased consumption of junk foods and street foods, lack of awareness of good nutrition and poor dietary practices is one of the major causes for onset of diseases and obesity among

the community. In the present study it was found that majority of the transwomen are overweight, they eat carbohydrate rich foods and fat rich foods in larger quantity. Eating fried foods is associated with the higher BMI and greater weight gain. The reason for their increased intake is due to their transition from male to female which alters their hunger and thereby results in increased energy intake. Another reason could be that they take coffee more than 3 times daily and therefore their sugar consumption is also high which may also lead to high incidence of overweight. In the present study it was found that the mean cholesterol intake is within the recommended levels, the reason could be that transwomen do not eat organ meats and shell fish frequently which are high in cholesterol, since they observe Thursdays and Saturdays and also they avoid on auspicious days like full moon days, and sankranthi. The mean calcium intake is lesser than the recommended level, the reason is quantity of milk consumed by the transwomen is less and it is consumed with coffee/tea. The amount added in the preparation of these beverages is very less in quantity. The result shows that there is a significant difference between pre test and post test questionnaire which denotes that the nutrition education programme had an impact over the transwomen.

### Conclusion

The results revealed that percentage of age decreases as age increases. The access to education, occupation, accommodation and health status is restricted and they have been ill treated by the society. Since they lack the basic facilities and are exposed to rejection, their dietary pattern is very poor. As a result of psychological stress, eating disorders are more common among them. They eat lot of fried foods, and bakery products this leads to increase in their body weight and results in overweight. These factors contribute to non communicable diseases such as overweight, hypertension and Diabetes mellitus. Measures like treating them equally, providing them with basic facilities and conducting nutrition education programme will create a great impact among the transgender society to achieve greater heights in their life and make them morally upright, nutritionally fit and intellectually well trained.

### Recommendation

There is inadequate research in India and also in Tamil nadu about transwomen and hence this study can be extended to transwomen living in other parts of Tamil Nadu. Nutrition education program should be conducted periodically to improve their health status and dietary practices.

### Limitation of the study

The sample size is restricted to hundred transwomen due to insufficient funds and time constraint. Bio Chemical assessments such as lipid profile, blood glucose level could be assessed.

### Relevance of the study

This study reveals that gender identity disorder in transwomen has lead to disordered eating pattern among their community. It also shows that they are not considered as a part of the society and hence their physiological need is not being met, therefore leading to psychological trauma which directly has an adverse effect towards their dietary habits and nutrient intake.

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