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## RESEARCH ARTICLE

### ASSESSMENT OF NUTRITIONAL STATUS AND IMPARTING DIET COUNSELLING ON SELECTED TRANSGENDERS IN COIMBATORE CITY

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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". MTF and FTM are the two gender identities which have been widely noted in transgender literature. The study aims at unraveling the nutritional status of the selected transgender in Coimbatore city. One hundred and twenty subjects from the age group of 20-70 years were selected from the locale by using Convenience sampling method. A detailed interview schedule was used to collect their demographic profile, lifestyle patterns, psychological aspects and assessment of nutritional status of the community was done by adopting standardized procedure were studied. Dietary survey was carried out to collect data on dietary history and dietary intake of the selected transgender using 24 hour recall method for three consecutive days. Biochemical parameters namely fasting and post prandial blood glucose level and blood pressure were analyzed and recorded to found the persons at risk of diet related diseases. Statistical analysis was applied to find the significance of their nutritional status based on the type of their activity in comparison to the Recommended Dietary Allowances. Findings of the study was based on the WHO (2004), 15 percent were underweight, 63 percent were ideal weight, and 20 percent were overweight. It was seen that two percent were obese as they consumed hormonal tablets as a process of transition for the development of secondary sex organs. Transgender community lacked a healthy life style pattern; and their mean nutrient intake was much below the standard values. Hence they lack the basic nutrients that are needed for a healthy living. Most of the transgender (92%) preferred non-vegetarian foods and consumed weekly. Emotional changes have an impact on the food consumption pattern. They have inadequate nutrients as they are subjected to rejection, racism and lack of medical health care. Transgender people may eat more or skip meals leading to malnutrition, obesity etc. Thus nutrition education plays a vital role in improving their standard of living and also the importance of consuming adequate nutrition. The major disease conditions were identified and pamphlets were prepared in local languages and distributed among the subjects to improve the health status.

**Key words:** Adolescence, Stress level, Management. Awareness, Impact

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## 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"( [www.gender.org](http://www.gender.org)). MTF Male to Female (MTF) and Female to Male

(FTM) are the two gender identities which have been widely noted in transgender literature (Xavier, 2000). It is important to understand the diversity of genders that exists in the transgender community. Some of them identify their gender as both male and female and others identify their gender as neither male nor female Kalz (2002). Transgender is a relatively rare condition, but is increasingly

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encountered in our modern society. In the world, the transgenders are estimated to be 600 crores Stewart (2008), There are roughly one million Hijra in India, representing approximately one in every four hundred post pubertal persons born male (Singer, 1997). The transgender population in Tamil Nadu would be roughly about 60,000. Emotional changes have an impact on the food consumption pattern. The use of substances such as anabolic steroids and certain supplements can adversely affect the health (Tang *et al.*, 2005). Overweight and obesity are problems that also affect a large subset of this community. This can cause a serious of health problems which includes diabetes, hypertension, cancer and heart diseases (Gruskin, *et al.* (2001) and Gilman (2003). This study aims at unraveling the nutritional status of the selected transgenders in Coimbatore city. Emotional changes have an impact on the food consumption pattern. They have inadequate nutrients as they are subjected to rejection, racism and lack of medical health care. Transgender people may eat more or skip meals leading to malnutrition, obesity and other nutritional complications. Hence the present study was undertaken with the following objectives to; Study the socio economic status of selected transgender group, Find out the life style pattern of selected transgender group, Find out the dietary habits of transgender group, Assess the awareness regarding nutrition and health concepts of transgender group.

## MATERIALS AND METHODS

Two urban and one semi urban areas in Coimbatore city namely Saibaba colony, Ukkadam and Thudiyalur were selected by convenience sampling technique for the present research. Investigator selected 120 subjects from the age group of 20-70 years by using sampling technique from the above mentioned locale.

### B. Conduct of the study

Socio economic status, life style pattern, dietary pattern, medical history, and psychological factors, were assessed for the 120 selected subjects using pre tested interview schedule.

Assessment of nutritional status of the community is one of the first steps in the formation of any public health strategy to combat malnutrition. So the investigator assessed the nutritional status of the selected transgenders by following standard procedure for anthropometric measurements like height, weight, waist and hip circumference was computed to calculated body mass index and waist hip ratio.

Dietary survey was carried out to collect data on dietary history and dietary intake of the selected transgenders. The data on dietary pattern included information with regard to meal pattern, food habits; frequency of consumption of fruits, vegetables, green leafy vegetables, fleshy foods and preserved foods was collected. The food consumption pattern of the transgenders at the time of survey was collected using 24 hour dietary recall method, over three consecutive days. Using the collected data, their nutrient intake was calculated. Biochemical parameters namely fasting and post prandial blood glucose level and the blood pressure were analyzed and found the persons at risk and were recorded. Statistical analysis of mean and standard deviation was used and 't' test was applied to find out the significance of the nutritional status of transgender based on the type of their activity in comparison to the Recommended Dietary Allowances.

## RESULTS AND DISCUSSION

### Socio-Economic Profile of the Selected Transgender

The demographic and socio-economic background revealed the following:

#### I. Age wise distribution of the selected subjects based on BMI

Table 1 shows the age wise distribution of selected subjects. Based on WHO (2004) classification of BMI, 15 percent of the subjects were underweight. Among the selected 120 transgenders, 34 percent and 13 percent of them belonged to the age group 20-30 years who had normal weight and underweight respectively. It is surprising to note that only one percent of the selected subjects in the

**Table 1. Age Wise Distribution of the Selected Subjects (N=120)**

Age (years)	Underweight (>19)		Normal weight (20-25)		Overweight (25-29)		Obese (<30)	
	No	%	No	%	No	%	No	%
20-30	15	13	40	34	10	8	-	-
31-40	4	3	23	19	11	9	2	1
41-50	-	-	6	5	1	0.5	1	0.5
51-60	1	0.5	5	4	-	-	-	-
>60	-	-	-	-	1	0.5	-	-

**Table 2. Activity Type of the Selected Subjects (N=120)**

Type of activity	Underweight (20)		Normal (74)		Overweight (23)		Obese (3)	
	No.	%	No	%	No.	%	No	%
Sedentary	7	6	25	21	6	5	2	1
Moderate	7	6	35	29	7	5.8	-	-
Heavy	6	5	14	12	9	7.5	1	0.5

**Table 3. Income Level of the Selected Subjects (N=120)**

Income level (HUDCO, 2004)	Underweight		Normal weight		Overweight		Obese	
	No	%	No	%	No	%	No	%
Low income (Rs.2100-4500)	15	13	47	39	11	9	2	1
Middle income (Rs.4501-7500)	4	3.3	21	17.5	8	7	1	0.5
High income (Rs.7501 and above)	1	0.5	6	5	3	2	0	0

**Table 4. Reasons for Transgenders Leaving their Family (N=120)**

Problems	Number	Percent
Not accepted	25	20
Hindrance in marriage for brothers and sisters	22	18
Ill treated	22	18
Live freely and happily	39	33
Feel embarrassed	12	10

**Table 5. Problems within the Community (N=120)**

Problems	Number	Percent
Misunderstanding	7	6
Distribution in collection of money	3	2
Jealousy	5	4

age of 31-40 years was found to be obese. With regard to their educational status of the transgender community 34 percent with normal weight had only primary and middle school education. The

researcher found that these subjects were not interested and hesitated to go to school after they recognized the abnormal changes in them. Twelve and 16 percent of the selected normal weight

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20-30	15	13	40	34	10	8	-	-
31-40	4	3	23	19	11	9	2	1
41-50	-	-	6	5	1	0.5	1	0.5
51-60	1	0.5	5	4	-	-	-	-
>60	-	-	-	-	1	0.5	-	-

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subjects respectively had higher secondary and college level education. Only one of the normal BMI subject was illiterate. Interestingly 36 of the selected subjects worked in private company and 28 of them had started business as they were illiterate and abused in their work area. Nine of them collected money from shops and 10 of them were sex worker as their part time job.

### 1. Type of activity of the selected transgenders

Table 2 shows the activity pattern of the transgender subjects. The above table reveals that 29 percent of normal weight subjects performed moderate activity like cooking and mechanical work, whereas seven percent each doing sedentary and heavy activity were overweight and underweight respectively. Twenty one percent of the sedentary worker had normal BMI and six percent had under weight. Even among heavy worker seven percent had overweight as against 12 percent who had normal weight.

### 2. Income level of the selected transgenders

Table 3 describes the monthly income pattern of selected subjects. Based on HUDCO (2004) classification 39 percent of the normal weight subjects as well as 13 percent of underweight and nine percent overweight respectively belonged to low income level. Seventeen percent of the normal weight subjects belonged to middle income and seven percent of overweight subjects belonged to middle income group. As far as the high income group is concerned five percent were normal weight and only two percent had overweight.

### Life style pattern of the transgenders

While assessing the exercise pattern of transgender, 17 percent of them had the habit of performing exercise. Among them 13 percent had the habit of walking daily whereas only three percent of them performed yoga daily. It was clear that only 16 percent of them had the habit of smoking. It was alarming to see that 14 percent of them smoked cigarettes daily; and two percent of them smoked beedi. Out of the selected subjects, 45 percent of them had chewing habits. Twenty six percent were pan parag users. Fourteen percent chewed gudka

daily and four percent chewed beetle leaves with tobacco. Forty five percent of them had the habit of consuming alcohol. Thirteen percent of the selected subjects drank beer, four percent consumed wine daily. Of the 120 selected subjects 87 percent of them had the habit of watching television. Thirty eight percent of them had snacking habits while watching television. The transgenders community is still not recognized in the society and they are abused; ill treated which reflects on their eating habits. It was found that 28 percent had the habit of eating while they were too disappointed or sad and showed their anger on food. Even when they are emotionally disturbed 72 percent were not having any food

### Psychological assessment

#### 1. Reasons for leaving their own family

Table 4 explains the reason for transgenders left their family. Among the selected 120 subjects, most of the subjects came out of the family after they recognized themselves as a transgenders. Thirty three percent were interested in free and happy life came, 20 percent were not accepted by the family members, 18 percent each had hindrance in the marriage of brothers and sisters due to their presence and were ill treated and only 10 percent felt embarrassed to live comfortably with the normal family members.

#### 2. Problems within the transgender community

The problems faced within the transgender community are shown in Table 5. It is clear from the Table 5 that six percent of the problems arise due to misunderstanding among themselves, four percent due to jealousy and two percent due to confusion in the distribution of collection of money.

### C. Dietary pattern of the selected transgenders

Almost all transgender (92%) were non-vegetarians. The green leafy vegetable consumption pattern among the selected transgender was according to doctor's recommendation. Iron rich foods like manathakali amaranth and fenugreek leaves were consumed by

most of the selected subjects. All the vegetables were consumed in rotation without monotonous usage of vegetables. Beans were consumed frequently followed by cabbage, beetroot, carrot, bitter gourd and brinjal. The consumption patterns of fruits among the selected subjects were found that banana was the most common fruit consumed by the transgender. Among them 44 percent consumed banana daily as it is of low cost and easily available. The next preferred fruit next to banana was apple followed by grapes, sweet lime and orange. The consumption pattern of non-vegetarians among selected transgender showed that 32 percent of selected transgender consumed egg daily and one each consumed beef and chicken daily. Forty percent of selected transgender consumed fish weekly. Fish consumption was recommended by the doctors as they reduced the chances of cardiac problems.

knowledge regarding the importance of nutrition. The expected visible fat intake all the mean nutrients intake were below the ICMR recommended dietary allowances. The difference between the recommended dietary allowance and actual nutrient intake was high which is statistically significant at one percent level. It can be inferred that expected fat intake the transgenders need to improve their diet so as to meet the ICMR recommendation and thereby the health as well.

The above table 7 indicates that the intake of the transgenders was much less than ICMR recommendation. All the nutrients expected calcium were far below the ICMR recommended dietary allowances. The deficit intake of the nutrients was significant at one percent level indicating the low food consumption pattern leading to deficiency of

**Table 6. Mean Nutrient Intake among the Selected Sedentary Activity Transgenders (N=31)**

Nutrients	Recommended values(ICMR)	Actual Mean intake ± S.D	t values
Carbohydrates(g)	270	199.5±57.6	8.01**
Energy (kcal)	2425	1048.5±245.8	36.7**
Protein (g)	60	28±6.9	30.06**
Fat(g)	20	25.7±8.08	4.66**
Fibre(g)	40	8.35±2.08	108.49**
Calcium(mg)	400	379.6±158.3	0.8435**
Iron(mg)	28	9.5±5.0	24.10**

**Table 7. Mean Nutrient Intake of the Moderate Activity Transgenders (N=74)**

Nutrients	Standard values(ICMR)	Actual Mean intake ± S.D	t values
Carbohydrates(g)	320	215±49.9	14.40**
Energy (kcal)	2875	1113.25±278.2	43.31**
Protein(g)	60	32±8.37	22.90**
Fat (g)	20	29.19±9.20	6.84**
Fibre(g)	40	6.53±2.06	111.24**
Calcium (mg)	400	451.89±145.18	2.44**
Iron(mg)	28	10.17±3.72	32.85**

\*\* One Percent level of Significant

**D. Nutritional analysis of the selected subjects**

**1. Mean nutrient intake of the Selected sedentary activity transgenders**

Table 6 depicts the mean nutrient intake of selected transgender activity. It is evident from the result that the selected subjects did not have enough

all the proximate principles, fibre and iron. It can be attributed that fewer intakes were due to poverty or unemployment or too heavy work load and they were more figure conscious.

**2. Mean nutrient intake of the moderate activity transgenders**

Table 8. Mean Nutrient Intake among the Heavy Working Transgenders (N=27)

Nutrients	Standard values(ICMR)	Actual Mean intake $\pm$ S.D	t values
Carbohydrates(g)	423	283.04 $\pm$ 42.05	16.30**
Energy (kcal)	3800	1332.9 $\pm$ 174.6	69.21**
Protein(g)	60	36.79 $\pm$ 7.84	14.49**
Fat(g)	20	30.70 $\pm$ 3.55	14.74**
Fiber(g)	40	7.12 $\pm$ 2.00	80.25**
Calcium(mg)	400	492.08 $\pm$ 97.65	4.61**
Iron(mg)	28	12.79 $\pm$ 5.03	14.81**

\*\* One Percent level of significant

The mean nutrient intake of the selected transgenders doing moderate activity is given in Table 7.

### 3. Mean nutrient intake among heavy worker transgenders

Table 8 portrays the nutritional status among heavy worker transgender. Only 50 percent of the nutrient intake of carbohydrate, energy, protein and iron met the RDA for the heavy worker transgenders. Thus the results call for imparting of nutrition education to bring about awareness and emphasize the importance of right dietary practices which are important aspects of health.

### E. Nutritional assessment of the selected transgenders

Ninety percent of the selected transgenders had low WHR (less than 0.9) and they were at lower risk of life style diseases. The common disease conditions seen among the selected subjects were diabetics, overweight, obesity and hypertension. Only three percent of the selected subjects had diabetes mellitus and all were non insulin dependent diabetes mellitus. The HIV awareness program was found to be effective as only three percent were affected by HIV.

### Conclusion and Recommendation

The results revealed that the transgenders are not considered as a part of the society. Thus they are

underprivileged and lack the basic infrastructure to lead a happy living in the present changing world. They are very few occupational choices and are at times forced to do jobs against their interest and satisfaction. Since, they lack both education and occupation; they have poor health conditions leading to various diseases and complications. The prevalent diseases identified among them are blood pressure, underweight, overweight, obese, diabetic and HIV. They undergo lots of psychological stress resulting from discrimination and ill treatment in the society. It does take time for them to adjust to various changes and their relationships in the society.

Thus the investigator thought of educating the transgenders regarding eating towards healthy living. Pamphlets made in local language were made to explain the various disorders, their symptoms, causes and dietary modifications were explained. The correct consumption quantity and various methods adopted for right cooking techniques were explained. The importance of vitamins and minerals for the well being of human being is stressed and advised to include these nutrient rich foods in their daily diet.

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