

ASSESSMENT OF NUTRITIONAL STATUS OF THE SELECTED TRANSGENDERS

By

K.PADHMINI

(11PD15)

**A THESIS SUBMITTED TO THE
AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND
HIGHER EDUCATION FOR WOMEN
COIMBATORE - 641 043.**

**IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE
IN
FOOD SERVICE MANAGEMENT AND DIETETICS**

MAY 2013

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CERTIFIED AS A BONAFIDE RESEARCH WORK

Dr. S. Jaganathan
10.5.2013

**Signature of the
Head of the Department**

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10/5/13

**Signature of the
Guide**

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I INTRODUCTION

Transgender is an umbrella term used to describe people whose gender identity (sense of themselves as male or female) or gender expression differs from that usually associated with their birth sex. Transgender is a general term applied to a variety of individuals, behaviors and groups involving tendencies to vary from culturally conventional gender roles (Glaade, 2010).

Transsexuals are transgender people who live or wish to live full time as members of the gender opposite to their birth sex. Biological females who wish to live and be recognized as men are called female-to-male (FTM) transsexuals or transsexual men. Biological males who wish to live and be recognized as women are called male-to-female (MTF) transsexuals or transsexual women (Curran, 2009).

Transgender is a relatively rare condition, but is increasingly encountered in our modern society. In the worldwide, the transgender are estimates that implies 15, 324,000 trans people on the planet. (US Census Bureau, estimates for mid, 2011). Their prevalence under the respective conditions yield a range from 1:11,900 to 1:45,000 for trans women and 1:30,400 to 1:200,000 for trans men (Cupere et al., 2007).

In India, conservative estimates for “hijra” is about 500,000, to 1, 000,000 (Nanda, 2000). Tamilnadu has an estimated population of 30,000 transgender people. It has made great strides in trying to integrate transgender people into society this includes welfare schemes by the government and acceptance of transgender people into the mainstream media and film industry(Express India, 2009). The estimated transgender population in Coimbatore is roughly two thousand one hundred (Dinamalar, 2010).

Transgender people may be eligible for diagnosis of gender identity disorder (GID) "only if [being transgender] causes distress or disability. This distress is referred to as *gender dysphoria* and may manifest as depression or inability to work and form healthy relationships with others. Transgender people who are comfortable with their gender,

whose gender does not directly cause inner frustration, or impair their functioning, do not suffer from Gender Identity Disorder (Rounsely, 1997).

Transiting from one gender to another gender is a complex process. Many transsexual people have a wish to alter their bodies. These physical changes are collectively known as “sex reassignment therapy” (The American Psychological Association, 1994).

The risk of surgery similar to those of other types of surgery, which includes a variety of complications such as nerve damage or infection. It is usually a variety of complications such as nerve damage or infection (Stega et al., 2008).

People with same sexual behaviors are at greater risk at greater risk for psychiatric disorder. Negative health consequences such as body image dissatisfaction and eating disorders also came to be seen as related to the specific lifestyle and subculture of openly gay. People tend to eat more or less to express their anger, depression on food. So they eat more or skip meals leading to malnutrition obesity (Rondegraff, 2001).

Transgender persons are often at higher risk for heart disease because of hormone use, smoking and obesity. All transgender people should have their blood pressure and cholesterol checked as generally recommended. Also transgender persons should learn about the signs and symptoms of heart disease and stroke (Ryan, 2009).

The use of substance such as anabolic steroids and certain supplement can adversely affect the health. Substances used were amphetamines including crystal meth, marijuana, ecstasy and cocaine. Use of these drugs has been linked to higher rates of HIV transmission. Overweight and obesity are problem that also affect a large subset of this community. This can cause a serious of health problems with includes diabetes, hypertension, cancer and heart diseases (Tang et al., 2003).

Tobacco use is a common and life-threatening problem in the lives of lesbian, gay, bisexual, and transgender youths. A rapidly expanding body of scientific knowledge, based on the experience of LGBT youths and adults, chronicles the magnitude of harm and health risk across the lifespan. Transgender persons use tobacco products at much higher rates than others. This can lead to a number of serious health problems, including heart disease, high blood pressure, lung disease and lung cancer. Smoking is also linked to slowed wound healing, hearing loss, peptic ulcer. Alcoholism leading to liver diseases and jaundice (Hunter, 1997).

Many transgender women will continue to endure stigma discrimination, and can feel socially isolated and marginalized by society, social mechanisms put them at increased risk for mental and other health problems, such as depression, suicide and suicide ideation, lack of negotiation power during sex, sexual abuse and coercion, hormone and substance use related needle sharing, sex in exchange for money or drugs, and sexually transmitted infections, including HIV (Baral, 2013).

Transgender people have particular health disparities as compared to the overall population. It is important to understand these disparities, but not to assume that all transgender people have the same risks (Machtiger, 2012).

Nutrition through visual aids and the group discussion can be implemented to change their life style pattern and improve the nutritional status among the transgenders.

The present study was undertaken with the following objectives to:

1. To find out the socio economic status of the selected transgenders
2. To find out the lifestyle pattern of the selected transgenders
3. To find out the nutritional status of the selected transgenders
4. To create awareness regarding nutrition and health concepts.
5. Impacting nutrition education of the selected transgenders.

II REVIEW OF LITERATURE

The literature pertaining to the topic entitled “**Assessment of Nutritional Status of the Selected Transgenders**” was reviewed under the following headings:

- A. Classification of the transgenders
- B. Global scenario of the transgenders
- C. Mental disorders of the transgenders
- D. Prevalence of lifestyle diseases of the transgenders
- E. Lifestyle trends of the transgenders
- F. Diet related disorders of the transgenders
- G. Prevalence of HIV of the transgenders

A. CLASSIFICATION OF THE TRANSGENDERS

Transgender refers to a range of individuals with atypical gender characteristics or gender identities discordant from their anatomic sex, including transsexuals, cross-dressers, and androgynists (Meyer and Northridge, 2007).

Lesbians: they are woman who are sexually and emotionally attached to members of the same sex and who form their primary loving and sexual relationships with other woman.

Gay: men who are sexually and emotionally attracted to other men and from their primary loving and sexual relationships with other men the term gay is sometimes used generically to include both men and women (APA Style Guide, 2007).

Transsexuals: are transgender people who live or wish to live full time as members of the gender opposite to their birth sex.

Crossdressers/Transvestites: persons (most often males) who choose to dress and appear as a person of the opposite sex. This may or may not have anything to do with sex; each person is different here (Micheal, 2000).

Gender Benders: people who dress in the clothing of both sexes with no intent of looking like either sex specifically; they just like how it looks on them or how it feels. A girl wearing a double breasted suit is often gender-bending: looking for notoriety (Schneider, 2008).

Gender Blenders: much like gender benders, but usually keep it low key to avoid conflict with public. A boy wearing plain girl jeans would be blending. (Gilbert, 2000)

Intersexed: a person whose sexual organs are ambiguous from birth or has aspects of both sexes. This is a physical condition.

Duo-Gendered: persons who believe they have aspects of both genders and will show different aspects of their gender based on internal states.

Gender Queer: anyone not fitting into the above gender classes but do not consider themselves to be part of the absolute "binary gender" group (Whittle, 2006).

Female to male: this means that someone who was born but who is somehow feels or acts female. An male to female person is also sometimes called transgender woman or transsexual woman or transman.

Male to female: it is a person who was born in male but who is somehow feels or acts female. An male to female person is also sometimes called transgender woman or transsexual woman or transwoman (Wikipedia, 2007).

Androgyne is a person who does not fit cleanly into the typical gender role of their society. It does not imply any specific form of sexual orientation. Androgynes may identify as beyond gender, between genders, moving across genders, entirely genderless, or any or all of these, exhibiting a variety of male, female, and other characteristics.

B. GLOBAL SCENARIO OF THE TRANSGENDERS

In the worldwide estimates 1:100,00 for trans women and 1:400,00 for trans men, a prevalence is lower than anyone else (Pauly, 2001)

In Singapore, reported a figure of 1:2900 for trans woman, 1:8,300 for trans men. They also present other evidence suggesting the actual prevalence might be as high (Tsoi, 1988).

In Iran, the director of socially vulnerable groups at the state agency for national wellbeing, who one can only imagine is relying on clinic based figures, recently cited figures indicating a prevalence of 1:13,000 (Alizadeh, 2010).

In the USA among 4-5 year old childrens, 6.0 percent (1:17) of boys and 11.8 percent (around 1:8) of girls were reported by their parents to behave like the opposite sex.(chi, 2011).

In the USA has recently reported that 0.3 percent (1:333) of adults may identified as transgender. Even higher figures are evident. Quotes the prevalence of roughly one thousand assigned males and one in one lakh assigned females seek sex reassignment surgery in USA (Gates, 2011).

Across the globe in Taiwan, have reported that, among university students , 2.2% (1:45) of birth assigned females (and 0.7% (1:143) of birth assigned males very often wished they were the other sex (Green, 2006).

In the Philippines report that around 1:357 of birth assigned males aged 15-24 to be male and do so because they feel that they are female. Among birth assigned females, 2.9% (1:34) indicated they perceived their gender as male, with another 1.3% indicating other (Cruz and Rogando, 2013).

In an international study spanning university undergraduates in seven societies (USA, UK, Hong Kong, Philippines, Singapore and Thailand) have found that 0.9% (1:111) and 2.4% (1:42)) of birth assigned males and females respectively reported that they all the time wished they born as the other sex (Witten et al., 2009).

In Thailand has estimated that around 0.6% (1.167) of birth assigned males there may be trans women. The vast majority of identify as a gender other than that assigned to them to them at birth (Woodward, 2002).

In Malaysia, it is estimated that 'Maknah' trans women range in numbers from 10,000 to 50,000. Based on the population of around 10 million birth assigned males (Jamaludin, 2001).

Around 400,000 hijira were found in Pakistan, based on the population of around 57 million birth assigned males, the prevalence rate would be around 1:143. The latest Indian census will allow citizens to identified themselves as third gender. Pakistan has plans to allow 'third sex' individuals to register with local authorities (Curran, 2009).

Lists fifty 'sistagirls' in the indigenous population of 2500 on the tiwi islands , A figure that implies, based on an estimate of 1250 birth assigned males of all ages. A prevalence rate of four per cent (Taylor, 2011).

If one in thousand is a transsexual who has had surgery but is in some way or another transgendered, using the above calculation worldwide then fourteen million men worldwide are transgendered not including women (Witten, 2002).

The DSM-IV (1994) quotes a prevalence of roughly 1 in 30,000 assigned males and 1 in 100,000 assigned females seek sex reassignment surgery in the USA (DSM, 2006).

The most frequently quoted estimate of prevalence is from the data, spanning more than four decades in which the clinic has treated roughly 95 percent of Dutch transsexual clients, gives figures of 1:10,000 assigned males and 1:30,000 assigned females. Though no direct studies on the prevalence of GID have been done, a variety of clinical papers published in the past 20 years provide estimates ranging from 1:7,400 to 1:42,000 in assigned males and 1:30,040 to 1:104,000 in assigned females (American Gender Dysphoria Clinic, 2008).

Higher prevalence, with minimum lower bounds of 1:4,500 male-to-female transsexual people and 1:8,000 female-to-male transsexual people for a number of countries in worldwide Human rights companion foundation, 2004).

Estimate the number of post-operative women in the US to be 32,000 and obtain a figure of 1:2500 male-to-female transsexual people. They further compare the annual incidences of Sex Reassignment Surgery and male birth in the U.S. to obtain a figure of 1:1000 MTF transsexual people and suggest a prevalence of 1:500 extrapolated from the rising rates of Sex Reassignment Surgery in the U.S. and a "common sense" estimate of the number of undiagnosed transsexual people (Olyslager and Conway, 2007).

The U.S. population of assigned males having already undergone reassignment surgery by the top three U.S. SRS surgeons alone is enough to account for the entire transsexual population implied by the 1:10,000 prevalence numbers. This excludes all other U.S. SRS surgeons, surgeons in countries such as Thailand, Canada, and others, and the high proportion of transsexual people who have not yet sought treatment, suggesting that a prevalence of 1:10,000 is too low.(Olyslager and Conway, 2008).

New Zealand passport holders who changed the sex on their passport and estimated those 1:3,639 birth-assigned males and 1:22,714 birth-assigned females were transsexual (Conway, 2008).

A presentation at the LGBT Health Summit in, United Kingdom, based upon figures from a number of reputable European and UK sources, shows that this population is increasing rapidly (14% per year) and that the mean age of transition is actually rising (Brown,1996).

C. MENTAL DISORDERS OF THE TRANSGENDERS

Transgender persons have higher rates of depression and anxiety compared to others. These problems are often worse for those who do not have adequate social support or who are unable to express their gender identity. As a result, teenagers and

young adults have an increased risk of suicide. However, culturally sensitive mental health services can help prevent and treat these problems (Bowman, 2008)

The study was conducted in USA, High rates of life time suicide thoughts (44,2%), suicide attempts (24,7%) have been observed. In some cases suicide attempts were the reason of their application to clinic and can be seen as a help seeking behavior. No suicide attempt was reported within the fallow up period and after the sex reassignment surgery (Schneider, 1981).

Transgendered individuals are discriminated in their family, school and workplace environments. These conditions are risk factors for depression, isolation, and suicide. Suicide thoughts and attempts in a long-term follow up of a transgender group who applied to a psychiatry clinic (Isreal, 1997).

Many transgender women will continue to endure stigma and discrimination, and can feel socially isolated and marginalised by society. These social mechanisms put them at increased risk for mental and other health problems, such as depression, suicide and suicide ideation, lack of negotiation power during sex, sexual abuse and coercion, hormone and substance use related needle sharing, sex in exchange for money or drugs, and sexually transmitted infections (Reberk, 2013).

Lesbian, gay, bisexual, or transgendered victims of bias-related violence may fear additional victimization if the cause of the attack is revealed; as a result, they may not disclose the attack or its cause. In these instances, this denial may prevent them from getting adequate external support needed to recover from the attack. Reactions to victimization may include posttraumatic stress disorder, sleep disturbances, anxiety, depression, nightmares, somatization, and illegal drug use as well as suicide attempts (Lambardi, 2006).

Suicide is a serious, preventable, global health problem. LGB mental health problems (including suicidal ideation and attempts) are related to minority stress, the

chronic stress of living in homophobic social environments (World Health Organization, 2011).

Among the various sources of anxiety for LGBT youths, stress related to sexual identity featured prominently. LGBT youth are more likely to use tobacco when they are hyper and the adrenaline is running high. People light up a cigarette right after an argument or if they are stressed (Kenegy, 2005).

Many transsexual people receive gender reassignment treatment, which usually involves hormone therapy and surgery, to help them appear more masculine or feminine (Taylor, 2011).

D. PREVALENCE OF LIFESTYLE DISEASES OF THE TRANSGENDERS

Hormone therapy is often used to make a transgender person more masculine or feminine. But the use of hormones has risks. Testosterone can damage the liver, especially if taken in high doses or by mouth. Estrogen can increase blood pressure, blood glucose (sugar), and blood clotting. Anti-androgens, such as spironolactone, can lower blood pressure, disturb electrolytes, and dehydrate the body (Nelson, 2008)

Tran's men who still have a uterus, ovaries, or breasts are at risk for cancer in these organs. Tran's women are at risk for prostate cancer, though this risk is low. Cancers related to use of hormones are rare (Ganly, 1995)

Many transgender persons use silicone injections to enhance their appearance. The injection of silicon by non-medical persons is a dangerous practice that can lead to serious health problems. Silicone injected outside of a health care setting is typically not medical grade, may be contaminated, and is often injected using shared needles which can transmit hepatitis (Gay and lesbian medical association, 2009)

It is vital to understand that geriatric care of the transsexual person must address social, psychological and physical needs, which are intertwined. Loss of vision, hearing,

or other sensorium may be more poignant for the transsexual who feels that he or she has wasted their youth by not transitioning earlier (Dahl, 2006).

Male to female transgender patient treated with estrogen detected a breast lump that was confirmed with metastatic breast cancer with spinal cord compression. They identified chest as a “male chest” that believed provided immunity against breast cancer. Therefore female social identity and her male biological identity were dissociated when the patient was evaluating the risk for breast cancer (Haarst, 1998).

Alcohol consumption is one of possible causal factors in the mortality among LGBT population. Alcohol consumption habits and prognostic impact of alcohol consumption on cardiovascular morbidity and mortality among LGBT population (Carlson and Hinman, 2004).

Prospective studies on the risk of breast cancer among male to female patients who have taken the feminizing hormones. A case of intraepithelial neoplasia has been reported in who underwent vaginoplasty with the glans penis used to create a neocervix (Lawrence, 2001).

For trans men, there is no evidence that taking testosterone contributes to diabetes or makes diabetes worse. However, testosterone does tend to have an impact on cholesterol and can affect blood pressure. If you are not able to bring such diabetic symptoms under control through diet, exercise, and/or medication, you may be switched to a different hormone combination or a different type of testosterone. If all else fails, your nurse or doctor may recommend that you decrease your testosterone dose to reduce your risk of heart disease (Robert, 2003).

Several studies of trans men who had not yet started testosterone showed increased rates of polycystic ovarian syndrome (PCOS) compared to other people born with ovaries. PCOS is associated with increased rate of pre-diabetes (vanderleest, 2009)

Estrogen is known to affect glucose tolerance and may increase trans women’s risk of diabetes. There is no evidence that testosterone increases trans men’s risk of Type 2

diabetes. However, trans men found increased fat deposits around the abdomen and the internal organs after starting testosterone, and this is considered a risk factor for insulin resistance (Vazquez, 2008).

E. LIFESTYLE TRENDS OF THE TRANSGENDERS

Alcohol consumption is one of possible causal factors in the mortality among LGBT population. Alcohol consumption habits and prognostic impact of alcohol consumption on cardiovascular morbidity and mortality among LGBT population (Mckirmana, 1989).

Smoking is highly prevalent among lesbian, gay men, bisexual, and transgender (LGBT) persons and contributes to health disparities. Specific behavioral, normative and control beliefs that can serve as intervention targets to reduce smoking in the LGBT community (Gruskin et al., 2004).

People who smoke are at greatest risk for lung cancer, and current evidence suggests that gay and bisexual men are more likely to smoke (33.2%) than men in the general population (21.3%) (Saslow, 2005).

Smoking is responsible for 87% of all lung cancers, as well as a host of other tobacco-related diseases such as heart disease, stroke, and emphysema. HIV makes the lungs less able to recover from the damage caused by smoking. This exposure increases the risk of lung cancer and other diseases caused by second hand smoke (Samuel, 2006)

Transgender persons have higher rates of alcohol abuse and dependence. Although limited alcohol use, such as one drink a day, may not be unhealthy, any use can be a problem for a transgender person with an alcohol related disorder. Alcohol abuse is a common problem among transgender persons and can increase the risk for being injured or becoming the victim of a crime (Lee, 2009).

Transgender persons smoke and use tobacco products at much higher rates than others, this can lead to a number of serious health problems, including heart disease, high blood pressure, lung disease and lung cancer (Bauer, 2009).

Tobacco use is a common and life-threatening problem in the lives of lesbian, gay, bisexual and transgender youths. A rapidly expanding body of scientific knowledge, based on the experience of LGBT youths and adults, chronicles the magnitude of harm and health risk across the lifespan (Xavier, 2000).

Alcoholism is defined as chronic dependence characterized by compulsive drinking of alcohol to such a degree that produces mental disturbances interferes with social and economical functioning (Marlowe, 2001).

F. DIET RELATED DISORDERS OF THE TRANSGENDERS

Obesity is associated with higher rates of heart disease, cancer and premature death. Problems with body image are more common among gay men are much more likely to experience an eating disorder such as bulimia or anorexia nervosa (Gruskin, 2001).

The diet related problems such as hypertension, cancer, diabetes mellitus. Gay men are likely to require diet modification to control disease, but the diet should still reflect. The diet should fit the person rather than changing the person's eating behavior (Robinson, 2008).

They have higher rates of alcohol use , poor nutrition and obesity. These factors may increase the risk of cancers .Transgender people are less likely to eat fruits and vegetables everyday (National institute of health, 2011).

Transgender persons are often at higher risk for heart disease because of hormone use, smoking, and obesity. All transgender persons should have their blood pressure and cholesterol checked as generally recommended. Also, transgender persons should learn about the signs and symptoms of heart disease and stroke (Bockting, 2009)

Transgender having difficulty gaining weight or muscle mass, with fatigue or anxiety should be screened for dietary protein, calorie and micronutrient/vitamin deficits. Appropriate intake should be adjusted to appropriate male age and activity levels. Trans

women may have eating disorders such as anorexia or may intentionally take in fewer calories than necessary in order to maintain a slight build (Vale, 2008).

G. PREVALENCE OF HIV OF THE TRANSGENDERS

Transgender women are a very high burden population for HIV and are in urgent need of prevention, treatment, and care services (Warren, 2012).

Prevalence rate of HPV in Argentina was 82.9 per cent. Sex work, a low level of formal education and a strong social stigmatization are conditions associated to a high STI prevalence. High risk genotypes detected, together with a situation of extreme social marginalization, discrimination and stigmatization make this population to be of extreme vulnerability (Bockting, 2005).

Human Papilloma Virus (HPV) infection is the most common sexually transmitted infection (STI), with approximately 75 per cent of sexually active trans adults acquiring one or more HPV types during their lifetime. Studies in the general population have shown that rates of HPV anal infection are as high as rates of cervical infection (Bockting, 2001).

Researchers have shown that LGBT youth more likely engage in riskier health-related behaviors, including smoking cigarettes using illicit substances , consuming alcohol and engaging in sexual behaviors, thus putting them at risk for HIV/AIDS and other sexually transmitted infections (STIs) (CDC, 2008).

Transgender persons use substances at higher rates compared to others. Substances used include amphetamines including crystal meth, marijuana, ecstasy, and cocaine. Use of these drugs has been linked to higher rates of HIV transmission through impaired decision making during sex. Although the long-term effects of these substances are unknown, evidence suggests that their prolonged use is likely to have serious negative health consequences (Dave et al, 2006).

Although similar data for transgender persons are lacking, this population experiences high rates of substance abuse. Characteristics which are typically associated

with a higher prevalence of smoking in the general population. Gay and bisexual men account disproportionately for HIV infection cases and HIV positive persons smoke at rates substantially above the general population (Centers for Disease Control and Prevention, 2007).

HIV and hepatitis B/C are transmitted by blood as well as through sex. As a whole, the transgender population is limited. The transgender population appears to have a disproportionately high rate of HIV/AIDS (Herbst, 2008).

Transgender have the higher exposure to the human papilloma virus (HPV) increases the risk of anal cancer. HPV risk is increased by having anal intercourse and many sex partners. Smoking is also a risk factor. Other risk factors include reduced immunity due to HIV infection or other factors, and long-term problems in the anal area, such as fistulas (abnormal openings) (Holman, 2006).

Transgender persons are at risk for sexually transmitted diseases. These include infections for which there are effective cures (gonorrhea, chlamydia, syphilis, pubic lice or crabs), as well as those for which treatments are more limited (HIV, hepatitis A, B, or C, human papilloma virus). Safe sex, including the use of barriers, is key to preventing STDs (Aberg, 2009).

III METHODOLOGY

The procedure adopted for the study entitled, “**Assessment of Nutritional Status of the Transgender**” is presented under the following heading,

- A. Selection of sample and conduct of the study
- B. Collection of data and formulation of interview schedule
- C. Assessment of nutritional status of the selected transgender
- D. Imparting nutrition education to the selected transgenders

A. SELECTION OF SAMPLE AND CONDUCT OF THE STUDY

The area chosen for the conduct of the study was Coimbatore city because of easy access and familiarity of the area to the researcher. Three areas in Coimbatore city namely vellakinaru pirivu, kavundampalayam, veerapandi pirivu was selected. This area was chosen because more number of transgenders resides in this area. One twenty subjects in the age group of 20-70 years were selected using stratified sampling method. In stratified sampling subjects were selected in such a way that every item in the population has an equal chance of being included. These areas were selected owing to the dearth of information about the nutritional status of transgenders and the support rendered from the respective organization. Face to face survey was conducted in the selected area. The higher officials and staff's were highly cooperative and helpful.

B. COLLECTION OF DATA AND FORMULATION OF INTERVIEW SCHEDULE

A survey was conducted to the selected one twenty subjects using a well-designed interview schedule was framed pretested components. An interview schedule is a form containing a set of questions, especially one addressed to a statistically significant number of subjects as a way of gathering information for a survey (Agarwal, 2004).

An interview schedule was formulated hence the same was adopted for the present study by the investigator as investigator as shown Appendix I. A schedule is the

name usually applied to asset of questions, which are asked and filled face to face contact with another person (Plate I).

The interview schedule comprise of socio economic background information like age, occupation, income, anthropometric measurements like height, weight, waist and hip circumference was collected. The main details about this lifestyle patterns like their physical activity, smoking and the habit of alcohol consumption, chewing of tobacco, gudka, panmasala and their eating pattern were obtained (Kothari, 2006). The psychological aspects of the selected subjects were also assessed. This will help the researcher to know the emotional stability in relation to their eating habits.

C. ASSESSMENT OF NUTRITIONAL STATUS OF THE TRANSGENDERS

The process of measuring nutritional health is usually termed as nutrition assessment. Assessment of nutritional status of the community is one of the first steps in the formation of any health strategy to compact malnutrition. The principle aim of such assessment is to determine the type, magnitude and distribution of malnutrition in different geographic areas to identify 'at risk' groups and to determine the contributory factor. So the investigator assessed the next status of the selected transgenders by adopting standardized procedure (Ross, 2010).

1. Anthropometric Measurements

Anthropometry is concerned with the measures of the variations of dimension and some aspects of gross composition of human body at different ages and at different levels of nutrition (Jelliffee and Jelliffee, 1991). The most commonly used anthropometric measurements such as height, weight, waist and hip circumference were recorded for all the selected 120 subjects.



**MEASURING THE WEIGHT OF
THE SUBJECT
PALTE I**



**MEASURING THE HEIGHT OF
THE SUBJECT
PLATE II**



**MEASURING THE HIP
CIRCUMFERENCE IF THE SUBJECT
PLATE III**



**MEASURING THE WAIST
CIRCUMFERENCE OF THE SUBJECT
PLATE IV**

ANTHROPOMETRIC MEASUREMENT OF THE SUBJECT



**ELECTING THE BACKGROUND INFORMATION OF THE SUBJECT
PLATE V**

a. Measurement of Height

The height of an individual is influenced both by genetic and environmental factors. Height of an individual is principally a measure of skeletal bone tissue.

The selected subjects were made to stand against the wall on a leveled surface without shoes, heels and toes apart. Using a short flat object flat on the person's head and mark on the wall, where the object touches the wall. Using the tape the distance from the floor to the mark on the wall as measured (Plate II). An average of two measurements is taken as the final measurement (Bamji, 2003).

b. Measurement of Weight

Body weight is the most widely used simplest method assesses the growth and development of an individual (NIN, 2009).

The weight of the selected one twenty subject was measured using a bathroom scale weighing balance. The individual were weighed with minimum clothing and without shoes. The individual did not lean against or hold any support, while care was taken to assure that the weight was measured (Plate III).

c. Body Mass Index

The Body Mass Index is to measure for human body shape based on an individual's weight and height. The most effective diagnostic examination is to look at the person and to decide whether the subjects were underweight, normal or overweight and obese. The anthropometric measurements and the body build were in accordance is to their biological sex (Garrow, 2000).

According to Krause is defined as $\text{weight (kg)/height(m)}^2$ as definition of the degree of adiposity. The classification of WHO is,

Category*	BMI (cut point value)
Under weight	>19
Normal	20-25
Overweight	25-29
Grade I obesity	30-34
Grade II obesity	34-39
Grade III obesity	<40

***WHO classification 2011**

d. Measurement of waist circumference

The measure of regional fat distribution in the recent study, particularly with the increasing incidence of obesity, considering the significance of adiposity in diet related chronic diseases, waist and hip circumferences are used to evaluate the abdominal adiposity of the selected subjects. The measurement is taken at the midway of the waist (Plate IV).

The selected subject was made to stand erect with weight evenly balanced on both feet, which were placed about 25-35 cm apart. The level of lowest rib and iliac crest in the midaxillary line was felt. The tape was passed round the waist horizontally between the lowest rib and iliac crest and the waist circumference was marked to the nearest millimeter (Hopkin, 2001).

e. Measurement of Hip Circumference

Hip was measured at the level of greater trochanters of the subjects in standing position and both feet together. Two consecutive recordings were made for each site to the nearest 0.5 cm using a non-stretchable measuring tape on a horizontal plane without compression of skin. The two sets of values were used (Plate V).

f. Measurement of Waist Hip Ratio

Waist hip circumference was taken for all the selected subjects with the help of an inch tape. The predominant distribution of fat in an obese person, whether in the upper part or the lower part of the body may determine the disease pattern. Abdominal obesity is often measured as the WHR which is the ratio of obesity in the upper trunk to that in the lower trunk (Hopkin, 2001).

The calculated WHR were computed for the entire subjects using the formula suggested by Marlowe and Wetsman (2001)

$$\text{Waist Hip Ratio} = \text{Waist (cm)}/\text{Hip (cm)}$$

2. Dietary Survey of the Selected Subjects

A dietary survey was conducted for all the selected one twenty subjects by using three days food recall method. In three days recall, the subjects intakes for period of three days was to determine to know the consumption pattern of foods or dietary of the selected subjects (Ross, 2010).

Purposive of using three days dietary recall is to provide data for designing a nutritional plan of care that will prevent or minimize. The development of malnutrition, identify if the individuals are malnourished or at the risk of developing. Based on the data collected the mean food and nutrient intake of the subjects were calculated by using food consumption table and compared with the RDA given by ICMR (Gopalan, 2009).

D. IMPARTING NUTRITION EDUCATION TO THE SELECTED TRANSGENDERS

Diet is a vital determinant of health and nutritional status of sample. Diet counseling plays an important role in development of healthy habits and positive attitudes towards food. Counseling was given to the selected subjects, counseling plays an

important role in motivating individual in development of healthy habits and positive attitudes towards life.

Nutrition education plays a key role in the prevention and management of nutritional status by promoting healthy eating habits. Impacting education helps in improving the lifestyle pattern and encourages them in leading a healthy life.

Diet therapy for transgenders which primarily involves moderately controlled carbohydrates and increase consumption of fruits and vegetables which improve their health condition, to prevent their nutritional deficiencies. Incidence of health disorders like diabetes, cancer, obesity, and cardiac problems were seen among transgender, so group counseling was given and nutrition education was imparted to them. Food pyramid, cooking methods was explained. The subjects very much interested in knowing about the healthy foods they also raised questions regarding their nutrient intake.

IV RESULTS AND DISCUSSION

The results of the study entitled “**Assessment of Nutritional Status of the Transgenders**” is presented and discussed under the headings:

- A. Socio economic profile of the selected transgenders
- B. Lifestyle pattern of the selected transgenders
- C. Dietary pattern of the selected transgenders
- D. Assessment of nutritional status among the selected transgenders

A. Socio Economic Profile of the transgenders

1a. BMI distribution of the selected transgender

Table 1a is shows the calculated Body Mass Index of the selected transgenders.

TABLE Ia

BODY MASS INDEX OF THE SELECTED TRANSGENDER

(N=120)

BMI classification	Number	Percent
Underweight (<18.5)	15	12.5
Normal (18.5-25)	60	50
Overweight (25-30)	26	21.7
Obese (>30)	19	15.8

Ib. Age wise distribution of the selected transgenders

Table Ib and Figure 1 shows the age wise distribution of the selected transgenders.

TABLE Ib
AGE WISE DISTRIBUTION OF THE SELECTED TRANSGENDERS
(N=120)

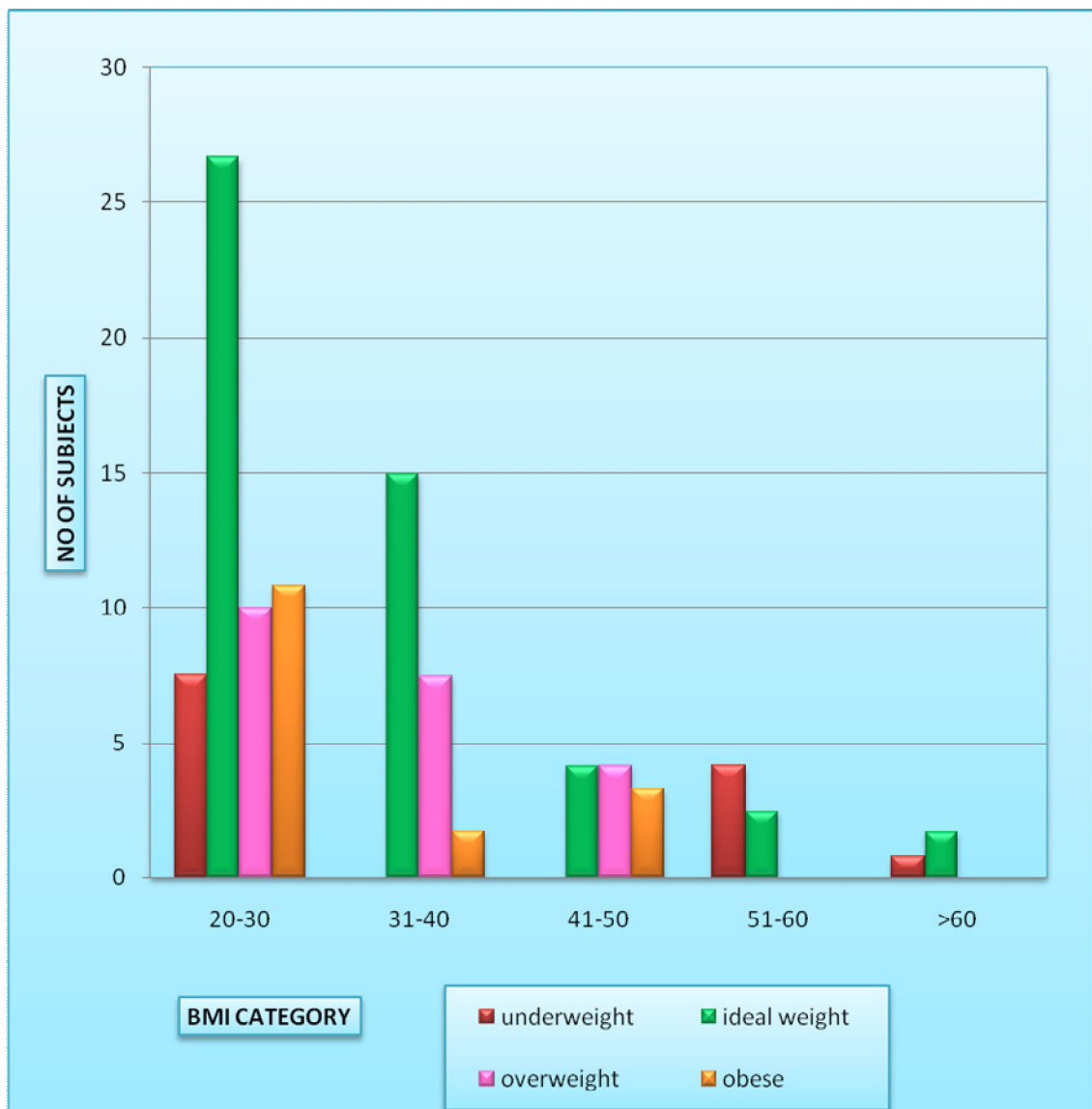
Age (years)	BMI							
	Underweight		Ideal weight		Overweight		Obese	
	No	%	No	%	No	%	No	%
0-30	9	7	32	26	12	10	13	10.8
31-40	-	-	18	15	9	7.5	2	1.7
41-50	-	-	5	4.2	5	4.2	4	3.3
51-60	5	4.2	3	2.5	-	-	-	-
>60	1	0.8	2	1.7	-	-	-	-

Based on the WHO (2004), 12 percent were underweight, 50 percent were normal weight, 21 percent were overweight, 19 percent were obese as they consumed more amount of non-vegetarian foods and have the habit of consuming more amount of junk foods and they consume hormonal tablets, hormonal injection as a process of transition of the development of secondary sex organs.

Hormonal therapy causes physical and psychological changes and they suffer from serious side effects like cancer, obesity, cardiovascular diseases, diabetes and hypertension (Hudspith, 2003).

Among the selected transgenders, 26 percent and 7 percent of in the age group of 20-30 years had normal weight and underweight category respectively. Fifteen percent,

seven percent and one percent of the selected subjects in the age group of 31-40 years were normal, over weight and obese respectively.



AGE AND BMI WISE DISTRIBUTION OF THE SELECTED TRANSGENDER
FIGURE 1

2. Educational qualification of the selected transgenders

Table II and Figure 2 shows the educational qualification of the selected transgenders.

TABLE II
EDUCATIONAL QUALIFICATION OF THE SELECTED TRANSGENDERS

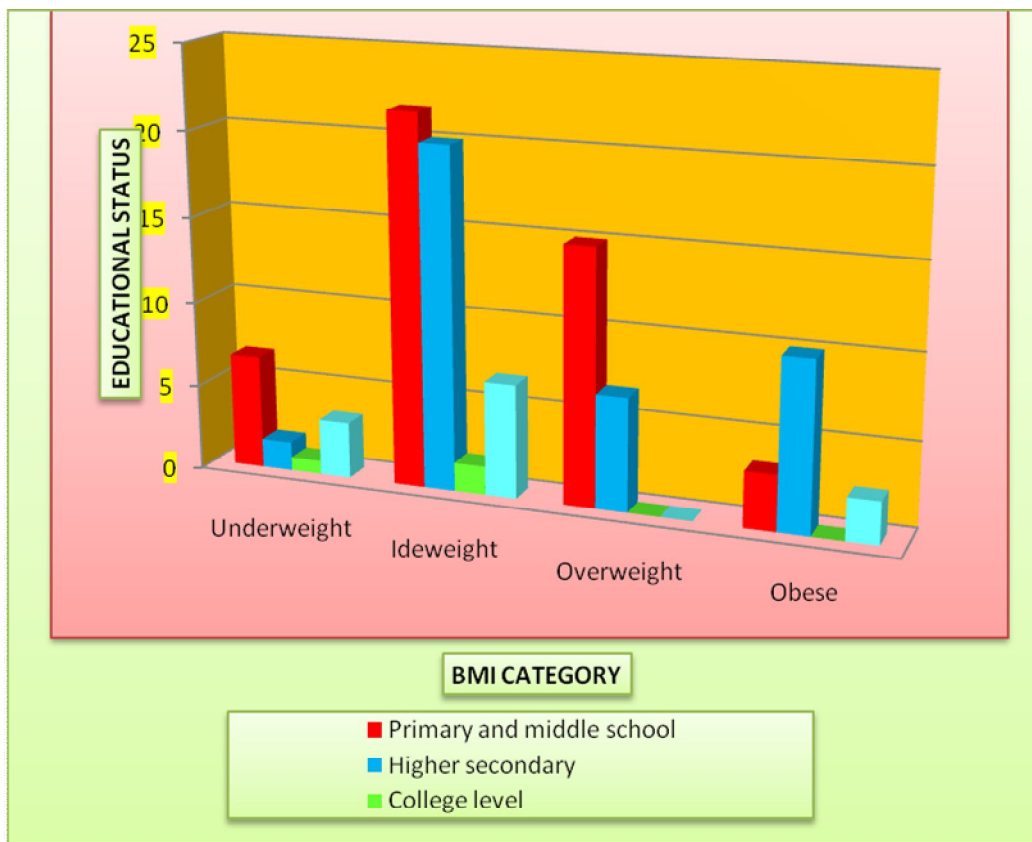
(N=120)

Educational Status	BMI category							
	Underweight		Normal weight		Overweight		Obese	
	No	%	No	%	No	%	No	%
Primary and middle school	8	6.7	26	21.7	18	15	4	3.3
Higher secondary	2	1.7	24	20	8	6.7	12	10
College level	1	0.8	2	1.7	-	-	-	-
Illiterate	4	3.3	8	6.7	-	-	3	2.5

With regard to the educational status of the transgenders community, 21 percent from ideal weight had only primary and middle school education. The subjects were not interested to go to school because they identified the abnormal changes in them and they faced social and psychological risks (Herek, 2000).

Twenty percent of the selected subjects were normal weight and 12 percent of the overweight subjects had higher secondary and three percent had ideal

weight. Less than one per cent finished their graduation; fifteen percent of them are illiterate.



EDUCATIONAL QUALIFICATION OF THE SELECTED TRANSGENDERS

FIGURE 2

3. Occupational status of the selected transgenders

Table III shows the occupational status of the selected transgenders.

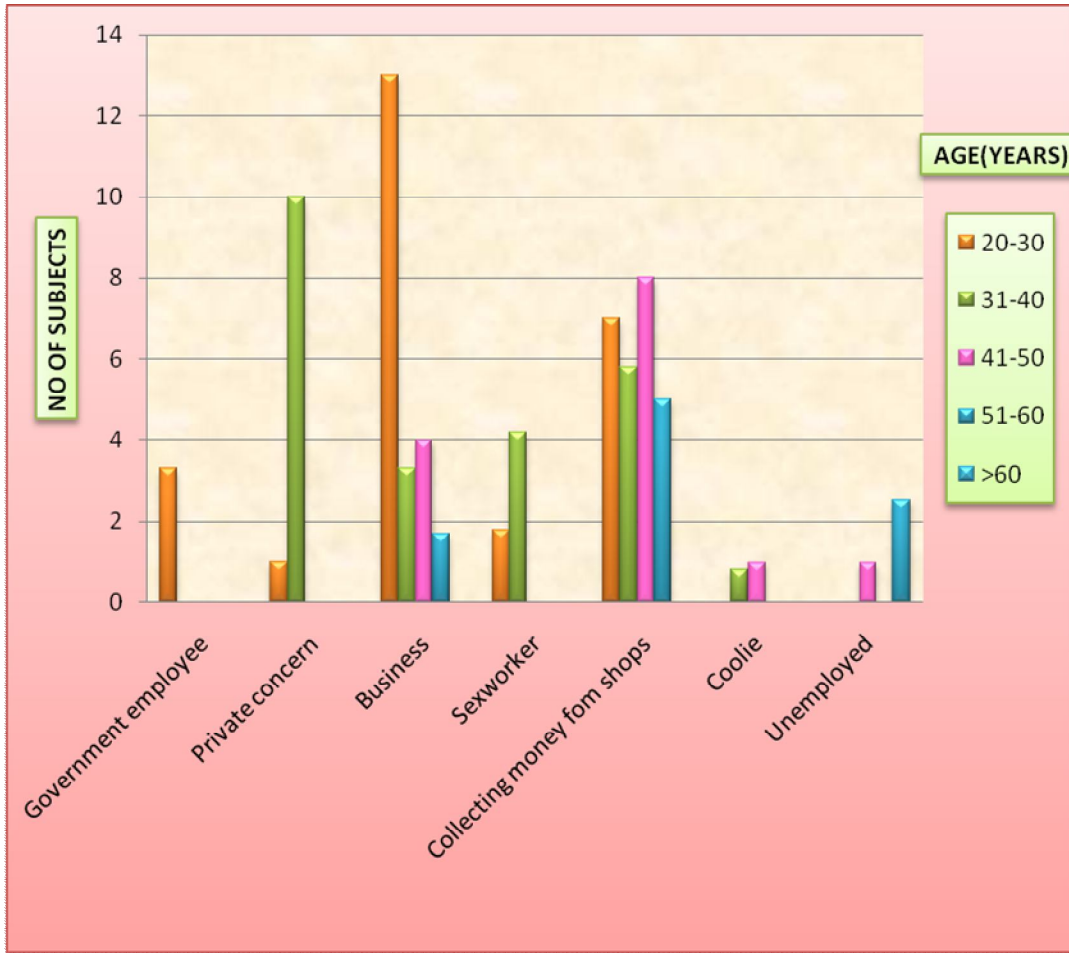
TABLE III
OCCUPATIONAL STATUS OF THE SELECTED
TRANSGENDER SUBJECTS

(N=120)

Occupation	Age (Years)										
	20-30		31-40		41-50		51-60		>60		
	No	%	No	%	No	%	No	%	No	%	
Government employee	4	3.3	-	-	-	-	-	-	-	-	-
Private company	13	1	12	10	-	-	-	-	-	-	-
Business	16	13	4	3.3	4	3.3	2	1.7	-	-	-
Sex worker	2	1.8	5	4.2	-	-	-	-	-	-	-
Collecting money from shops	9	7	7	5.8	8	6.6	6	5	-	-	-
Coolie	-	-	1	0.8	1	0.8	-	-	-	-	-
Unemployed	-	-	-	-	1	0.8	-	-	3	2.5	-

This table shows revealed that 10 percent of the selected subjects in the age group of 20-30 years worked in a private company, 13 percent of them started business like cooking, machinery work. Seven percent of them collecting money from the shops in the age group of 31-40 years. Less than one percent of them coolie in the age group of 31-40 and 41-50 respectively. Three percent of them were government employee in the age group of 20-30 years; few of them are a sex worker. One percent and three percent

of them unemployed in the age group of 20-30 years and 31-40 years respectively. Many transgenders people are faced lot of discrimination in the work place and they not supposed to appoint the job because they were transgenders (Baral, 2013).



OCCUPATIONAL STATUS OF THE SELECTED TRANSGENDERS

FIGURE 3

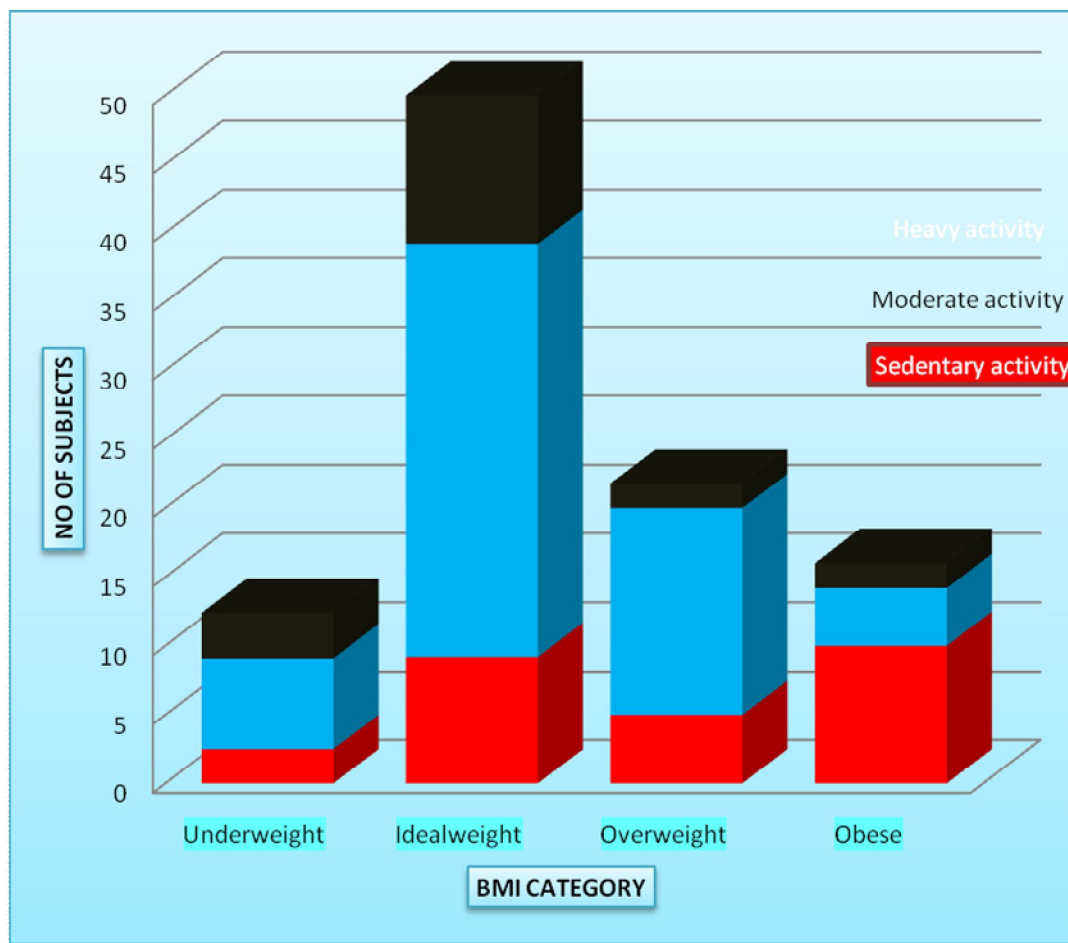
4. Type of activity among the selected transgenders

Table IV shows the activity pattern of the selected transgenders.

TABLE IV
TYPE OF ACTIVITY OF THE SELECTED TRANSGENDERS
(N=120)

Type of activity	Under weight		Normal weight		Over weight		Obese	
	No	%	No	%	No	%	No	%
Sedentary worker	3	2.5	11	9.2	6	5	12	10
Moderate worker	8	6.6	36	30	18	15	5	4.2
Heavy worker	4	3.3	13	10.8	2	1.8	2	1.8

The above table reveals that 30 percent of ideal weight subjects performed moderate activity like cooking, whereas 15 percent and 4 percent of them were overweight and underweight respectively. Nine percent of the sedentary worker had normal BMI, six percent of them were under weight and ten percent of the subjects were obese comes under the sedentary activity. Ten percent of the subject were heavy worker, four percent subjects performed moderate activity.



TYPE OF ACTIVITY OF THE SELECTED TRANSGENDERS

FIGURE 4

5. Income level of the selected transgenders

The monthly income of selected transgenders is projected in Table V.

TABLE V**INCOME LEVEL OF THE SELECTED TRANSGENDERS (N=120)**

Income level Amount (rs)	Under weight		Normal weight		Over weight		Obese	
	NO	%	NO	%	NO	%	NO	%
Low income (2500-4500)	5	4	49	40	16	13	8	6
Middle income (4500-7500)	6	5	9	7.5	9	7.5	10	8.3
High income (>7500)	4	3.3	2	1.7	1	0.8	1	0.8

Based on HUDCO (2004) classification four percent, 40 percent, 13 percent and six percent of the underweight, ideal weight, overweight and obese subjects belonged to low income level, and only one percent of the subjects had ideal weight belonging to high income. Eight percent of the underweight belonged to high income.

6. Expenditure pattern of the selected transgenders

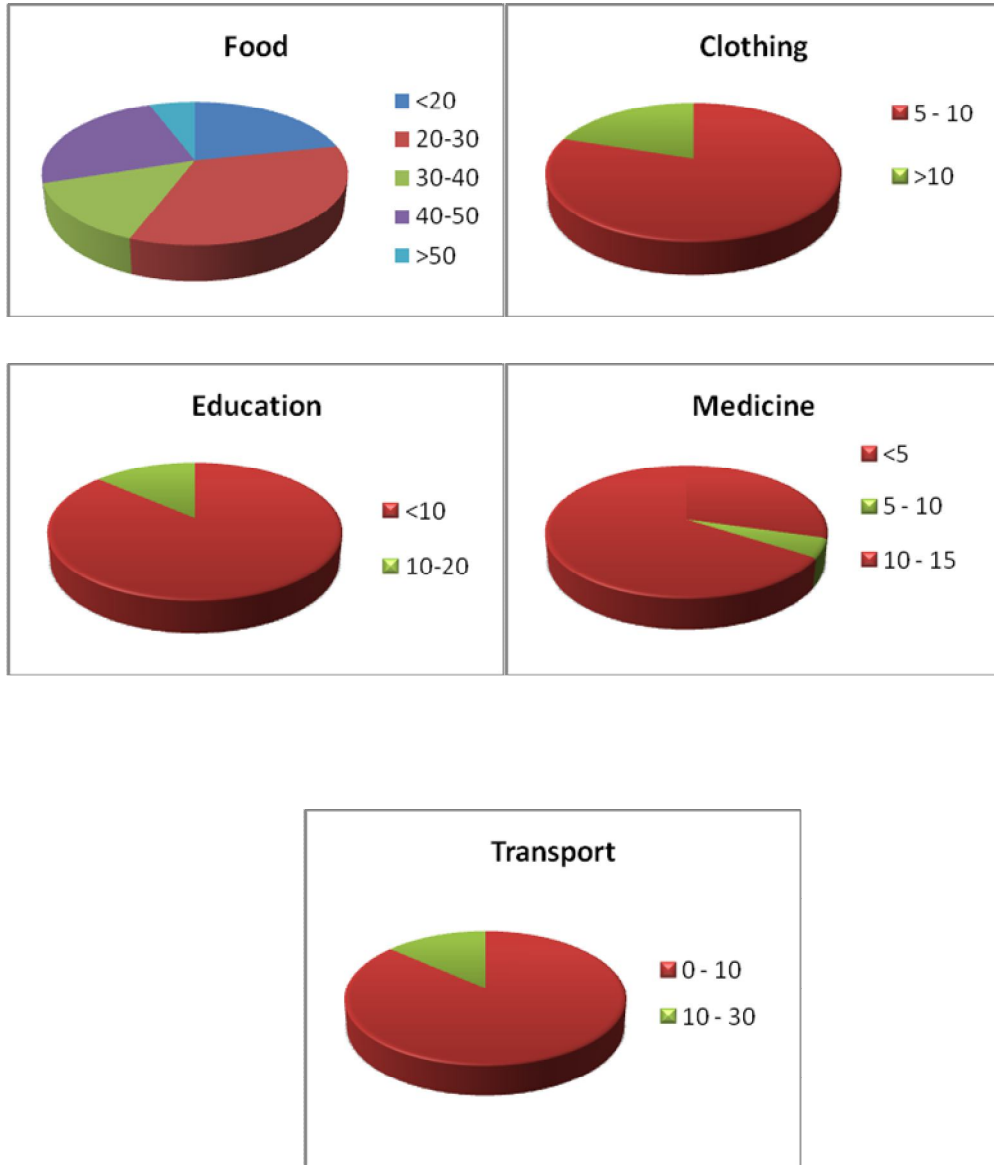
Information regarding the expenditure pattern of the selected subjects is given table VI and Figure 5.

TABLE VI
EXPENDITURE PATTERN OF THE SELECTED TRANSGENDERS (N=120)

Details	Percentage of expenditure	Number	Percent
Food	<20	26	21.7
	20-30	41	34.2
	30-40	17	14.2
	40-50	29	24.2
	>50	7	5.8
Clothing	5-10	96	80
	>10	24	20
Education	<10	13	10.8
	10-20	2	1.7
Medicine	<5	29	24.2
	5-10	10	8.3
	10-15	9	7.5
Transport	0-10	62	51.6
	10-30	58	48.3

The above table reveals that 34 percent of the subjects spent 20-30 percent on food and 24 percent spent more than 50 percent. Eighty percent of the selected subjects spent

5-10 percent monthly income towards clothing expenses and 20 percent spent more than 10 percent. Only small amount spent towards their education. Twenty percent of them spent less than 5 percent for medicine. Fifty one percent of them spent 0-10 percent for transportation and 48 per cent were spent 10-30 percent.



EXPENDITURE PATTERN OF THE SELECTED TRANSGENDERS

FIGURE 5

B. LIFE STYLE PATTERN OF THE TRANSGENDERS

1. Mode of transportation of the work place by the transgenders

Table VII shows the details regarding the mode of transportation to their workplace by the selected subjects.

TABLE VII

MODE OF TRANSPORTATION OF THE SELECTED TRANSGENDER (N=120)

Mode of Transportation	No	%	Duration of Travelling					
			<1/2hour		1/2-1hour		>1hour	
			No	%	No	%	No	%
Walking	12	10	8	6.6	4	3.3	-	-
Cycling	6	5	4	3.3	2	1.7	-	-
Public transport	98	81	48	40	26	21	22	18
Two wheeler	4	3.3	2	1.7	2	1.7	-	-

Among the selected 120 transgenders, 81 percent used public transportation as their mode of travelling. While considering the duration of travel 40 percent travelled less than half an hour, 24 percent travelled about half an hour to one hour. Ten and five percent of them walked and cycled to their work place respectively.

2. Smoking pattern of the selected transgenders

Table VIII explains the pattern of smoking among the selected transgenders.

TABLE VIII

SMOKING PATTERN OF THE SELECTED TRANSGENDERS

(N=120)

Type	Frequency			Number per day		
	Daily	Weekly	Rarely	<5	5-10	>5
Cigarette	19	-	-	9	6	4
Beedi	22	-	-	16	3	3

From table VIII it was clear that only 41 of them had the habit of smoking. It was alarming to see that nine of them smoked cigarettes daily, among them 22 of them smoked half a packet a day.

4. Chewing habits among the selected transgenders

The chewing among selected subjects is shown in Table IX.

TABLE IX**HABIT OF CHEWING TOBACCO AMONG THE SELECTED
TRANSGENDERS****(N=120)**

Materials used	Frequency			Number per day		
	Daily	Weekly	Rarely	<5	5-10	>10
Gudka	16	4	4	10	11	3
Panparag	4	-	4	2	4	2
Beetel leaves with tobacco	8	2	10	6	3	9

The above table reveals that chewing habit among the transgenders community. Out of the 120 transgenders, 52 of them had habit of chewing tobacco and others. Among the 24 selected transgenders were panparag users, four of them daily users and four of them chewed less than five packets a day; 11 of them chewed more than five to ten packets. Sixteen subjects chewed gudka daily and eight subjects chewed betel leaves with tobacco.

4. Alcohol consumption pattern among the selected transgender subjects

Alcohol consumption pattern among the selected transgender subjects is explained in Table X.

TABLE X
HABIT OF ALCOHOL CONSUMPTION PATTERN AMONG THE
SELECTED TRANSGENDER SUBJECTS

(N=120)

Type of alcohol	Frequency			Quantity (ml)		
	Daily	Weekly	Rarely	100-250	250-500	>500
Beer	10	26	14	16	11	23
Brandy	5	10	16	18	10	3
Whiskey	4	3	2	3	4	2
Wine	16	9	4	12	12	5
Toddy	-	-	4	1	3	-

*Multiple responses

Fifty seven of them had habit of consuming alcohol, twenty six of the selected subjects drank beer weekly and ten of them consumed daily. While considering the quantity 23 of them consumed more than 500ml daily. Sixteen of the selected transgenders consumed wine rarely. Twelve of the subjects consumed about 100-250 ml and five of the selected transgenders more than 500 ml of them drank wine, five of them drank toddy rarely.

5. Habit of watching television among the selected transgenders

The main entertainment seen among the selected subjects was watching television. Of the 120 selected transgenders 85 percent of them had habit of watching television, 52 percent watched television more than an hour and twenty one percent watched television for about less than an hour and 12 percent watched for about half an hour to one hour.

6. Snaking pattern seen among the transgenders

Among the selected 120 transgenders, 48 of them had snacking habits while watching television, whereas 19 percent snacked less than half a packet of chips. It was found that seven percent of them 20-25 grams of samosa/cutlet and ten percent ate bakery foods like bread, bun, biscuits and cake. Only two percent ate more than five numbers of biscuits and three percent ate one to five numbers of chocolate.

7. Reasons for eating late hours by the transgenders

The occupation of the transgender community was never permanent. Hence, when they are occupied with a job, they do it with full involvement and concentrated resulting in skipping meal timings. Among the selected 120 transgenders 68 percent had the habit of eating late hours.

8. Sex Reassignment Surgery

Among the selected 120 transgenders, 98 subjects were underwent sex reassignment surgery, 22 subjects were not done.

C. DIETARY PATTERN OF THE SELECTED TRANSGENDERS

1. Dietary habits of the selected transgender transgenders

Table XI shows the preference of daily habits of the selected transgenders.

TABLE XI

FOOD HABITS OF THE SELECTED TRANSGENDERS (N=120)

Food habits	Number	percent
Vegetarian	32	26.7
Non-vegetarian	88	73.3

Eating habit is decided the person's health. This table shows that, 73 percent of them were non-vegetarian; 32 percent of them eating only vegetarian foods.

2. Non-vegetarian food consumption pattern of the selected transgenders

Table XII shows the pattern of non-vegetarian consumption among selected transgenders.

TABLE XII**NON-VEGETARIAN FOOD CONSUMPTION PATTERN OF THE SELECTED TRANSGENDERS (N=120)**

Type of non-Vegetarian items	Frequency						Quantity (g)					
	Daily		Weekly		Rarely		100-250		250-500		>500	
	No	%	No	%	No	%	No	%	No	%	No	%
Beef	-	-	6	5	16	13	12	10	5	4.2	5	4.2
Chicken	10	8.3	32	26	4	3.2	26	21.7	18	15	2	1.7
Eggs	40	33	8	6.6	2	1.7	29	24	21	17.5	-	-
Fish	12	10	2	1.7	8	6.6	22	23	20	16	-	-
Meat	18	15	16	13.3	8	6.6	26	21	16	13.3	-	-

*Multiple responses

The consumption pattern of non-vegetarians among selected transgenders was shown in Table XVII. Thirty three percent of selected transgenders consumed eggs daily and eight percent, ten percent, 15 percent were consume chicken, fish and meat respectively. Only one percent consumed fish weekly in the form of fry. Fish consumption was recommended by the doctors as reduced the chances of cardiac problems.

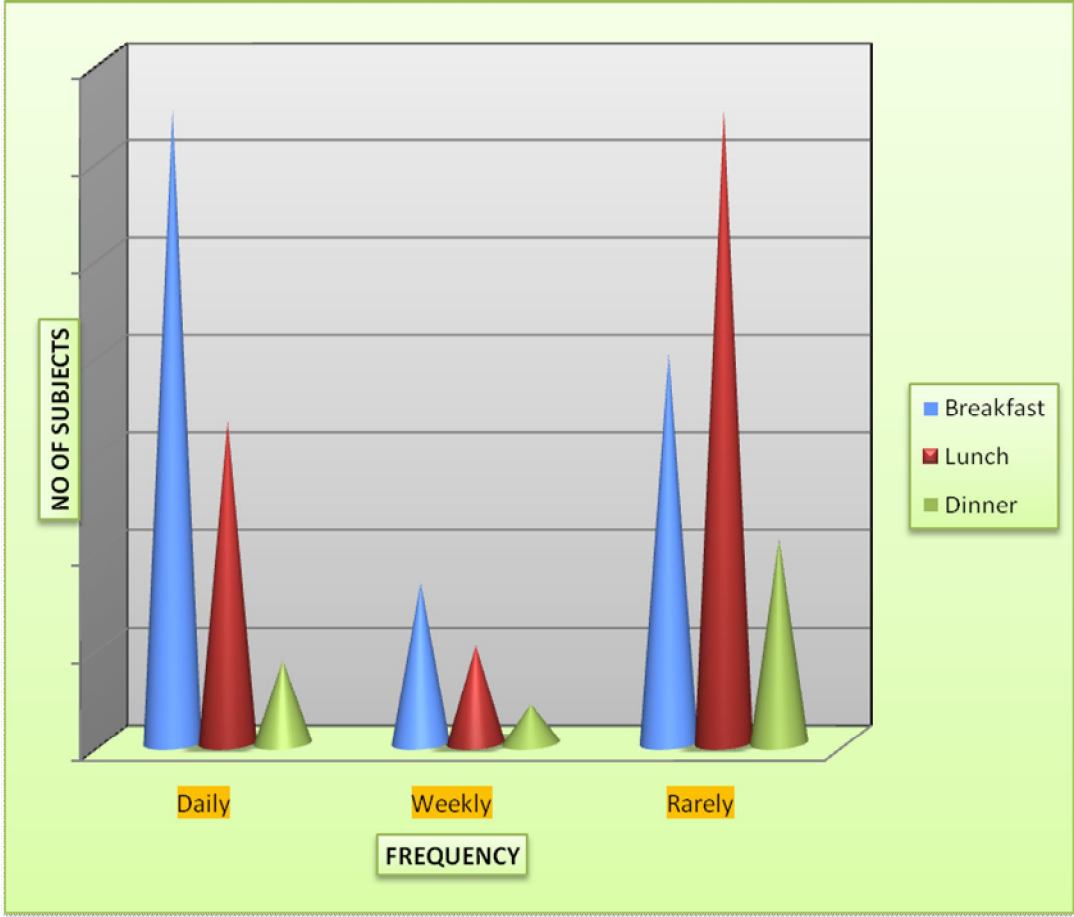
3. Pattern of skipping meals among the selected transgenders

Table XII and Figure 6 explains the pattern of skipping meals among the selected transgenders

TABLE XIII**SKIPPING MEAL PATTERN AMONG THE SELECTED TRANSGENDERS (N=120)**

Meal timings	Frequency					
	Daily		Weekly		Rarely	
	No	%	No	%	No	%
Breakfast	16	13	4	3.3	10	8
Lunch	8	6.6	3	2	16	13
Dinner	2	1.7	1	0.8	5	4.2

Breakfast is considered as an important meal in a day but it was found out that daily 13 percent of the selected transgenders skipped breakfast and eight percent weekly. Skipping pattern for lunch on daily, weekly and rarely basis was found among eight percent, two percent and 13 percent respectively. Of the selected subjects only less than one percent had the habit of skipping dinner daily.



SKIPPING MEAL PATTERN THE SELECTED TRANSGENDERS

FIGURE 6

4. Meal pattern among the transgenders

The meal consumption per day among the selected transgenders is shown in table XVI.

TABLE XIV

MEALS CONSUMED PER DAY BY THE SELECTED TRNSGENDERS

(N=120)

Meals consumed per day	Under weight		Ideal weight		Over weight		Obese	
	No	%	No	%	No	%	No	%
<3meals	5	4.2	32	26.7	16	13	11	9.2
3meals	6	5	24	20	5	4.2	7	5.8
>meals	4	3.2	4	3.2	5	4.2	1	0.8

It was seen that out of selected 120 transgenders, four percent of the underweight, 13 percent of overweight subjects and 16 percent of ideal weight subjects consumed less than three meals a day. Among the subjects who consumed three meals a day five percent were under weight, 20 percent were overweight and five percent were obese.

5. Water consumption pattern among the selected transgenders

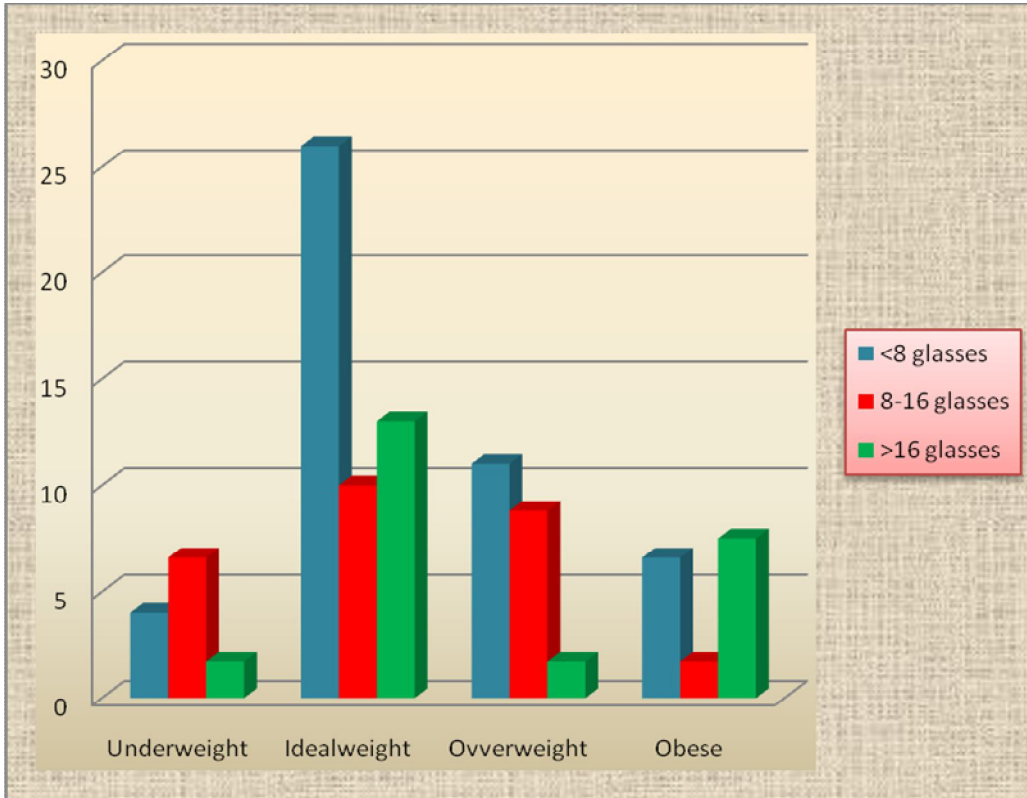
Water consumed per day among the selected transgenders is explained in table XV and Figure 7.

TABLE XV
WATER CONSUMPTION PATTERN AMONG THE SELECTED
TRANSGENDER

(N=120)

Amount of water consumed	Under weight		Ideal weight		Over weight		Obese	
	No	%	No	%	No	%	No	%
<8 glasses	5	4	32	26	14	11	8	6.6
8-16 glasses	8	6.6	12	10	10	8.8	2	1.7
>16 glasses	2	1.7	16	13	2	1.7	9	7.5

Water plays an important role in the normal metabolism of the body functions. Water helps in electrolyte balance. This table shows that 26 percent of the normal weight subjects consumed less than 2 liters of water per day. Seven percent of overweight subjects consumed more than 16 glasses of water per day.



**WATER CONSUMPTION PATTERN AMONG THE
SELECTED TRANSGENDERS**

FIGURE 7

5. Green leafy vegetables consumption among the selected transgenders

Table XVI explains the green leafy vegetable consumption among the selected transgenders.

TABLE XVI**CONSUMPTION PATTERN OF GREENLEAFY VEGETABLES AMONG THE
SELECTED TRANSGENDERS (N=120)**

Type of green leafy vegetables	Frequency			Quantity (g)		
	Daily	weekly	rarely	<100	100-150	>250
Agathi	2	24	9	8	22	5
Amaranth	-	32	9	16	21	4
fenugreek	5	19	3	14	11	2
Manathakkali	1	29	6	17	12	7
Mint	6	8	5	5	8	6
Spinach	-	-	8	3	5	-

*Multiple responses

Table XIV explained the green leafy vegetable consumption pattern among the selected transgenders. According to doctors recommendation on iron rich foods manathakkali leaves was consumed by most of the selected subjects followed by amaranth and fenugreek. Most of the selected transgenders consumed 100-150 grams of green leafy vegetables and weekly twice.

5. Fruits consumption pattern among the selected transgender subjects

Table XVII explains the pattern of fruits consumption among the selected transgender subjects.

TABLE XVII
FRUITS CONSUMED AMONG THE SELECTED TRANSGENDER

N = 120

Types of Fruits	Frequency						Quantity (g)					
	Daily		Weekly		Rarely		<50		50-100		>100	
	No	%	No	%	No	%	No	%	No	%	No	%
Apple	4	3	20	16.6	12	10	16	13	8	6.6	12	10
Banana	21	17.5	42	35	4	3	8	6.6	32	26	27	23
Guava	12	10	4	3.2	1	0.8	8	6.6	5	3.2	5	4.2
Grapes	6	5	12	10	4	3	12	10	6	5	4	3.2
Sweet lime	3	2.5	6	5	8	6.6	14	16	3	2.5	-	-
Orange	4	3	8	6.6	6	5	9	7.5	6	5	3	2.5
Papaya	-	-	10	8.3	14	11.6	19	15.8	5	4.2	-	-
Pomegranate	10	8.3	8	6.6	8	6.6	16	13.3	8	6.6	2	1.7
Sapota	10	8.3	4	3	6	5	10	8.3	10	8.3	-	-
Musk melon	-	-	-	-	4	3	6	5	10	8.3	10	8.3
Jack fruit	-	-	-	-	12	10	6	5	3	2.5	3	2.5
Amla	-	-	-	-	6	5	3	2.5	3	2.5	3	2.5
Pine apple	-	-	-	-	1	0.8	-	-	1	0.8	-	-

*Multiple responses

Table XV showed the consumption pattern of fruits among the selected subjects and was found that banana was the most common fruit consumed by the transgenders. Among the 21 percent consumed banana daily as it is low cost and easily available. The next preferred fruit was apple, followed by grapes, sweet lime and orange. Ten percent of transgender consumed these fruits on weekly basis. Papaya and pine apple were never consumed by theselected transgenders, because these subjects were under the hormonal tablets and injection for development of secondary sexual growth.

6. Consumption of beverages among the selected transgender subjects

Beverage consumption pattern of the selected transgenders is shown in Table XVIII.

TABLE XVIII
CONSUMPTION PATTERN OF BEVERAGES BY THE
SELECTED TRANSGENDERS

(N=120)

Type of Beverages	Frequency						Number of cups					
	Daily		Weekly		Rarely		2-3		4-5		>5	
	No	%	No	%	No	%	No	%	No	%	No	%
Coffee	42	35	-	-	-	-	40	33	3	2.5	-	-
Tea	36	30	-	-	-	-	36	30	2	1.7	-	-
Health drinks	21	17.5	3	2.5	-	-	24	20	-	-	-	-
Soft drinks	40	33	-	-	-	-	20	16	10	8.8	10	8.8

*Multiple responses

Beverages consumption is most common among the transgenders. The reported that beverages boost their energy and keep them active always. Thirty percent, 35 percent and 33 percent of the selected transgenders consumed tea coffee and softdrinks daily. Among the 33 percent drank 2-3 cups and two percent about 4-5 cups of tea.

9. Consumption pattern of preserved foods among transgender

Preserved foods consumption pattern among the selected transgenders is shown in Table XIX.

TABLE XIX
PRESERVED FOODS CONSUMPTION PATTERN AMONG THE SELECTED
SUBJECTS (N=120)

Types of Preserved foods	Frequency						Quantity					
	Daily		Weekly		Rarely		<50		50-100		>100	
	NO	%	No	%	No	%	No	%	No	%	No	%
Jam	-	-	10	8	12	10	20	16.6	2	1.7	-	-
Appalam/vadagam	40	33	5	4.2	2	1.7	20	16.6	20	16.6	-	-
Pickle	36	30	14	12	4	3.2	-	-	-	-	-	-
Dry fish	12	10	-	-	3	2.5	19	15.8	10	8.3	5	4.2
Dry meat	-	-	-	-	4	3.2	2	1.7	2	1.7	7	5.8

*Multiple responses

The pickle and appalam was often consumed by the transgenders. Thirty three per cent and 30 per cent of transgenders consumed less than 50 grams of appalam and pickle daily respectively. Ten per cent of them consumed dry fish daily. Eight percent of them taking jam weekly and ten per cent taking rarely. Three transgenders consumed dry fish rarely.

D. Assessment of nutritional status among the selected transgenders

1. Mean nutrient intake of the selected transgenders (sedentary activity)

Table XX depicts the mean nutrient intake of selected transgenders.

TABLE XX

**MEAN NUTRIENT ANALYSIS AMONG THE SELECTED TRANSGENDERS
(N=120)**

Nutrients	Standard Values (ICMR)	Means ±S.D	't' Values	Significant
Carbohydrates	270	250.50 ± 86.57	0.73	NS
Energy	2425	1643.38 ± 488.01	32.56	**
Protein	60	53.80 ± 16.79	1.24	NS
Fat	20	40.92 ± 24.22	5.21	**
Fiber	40	14.66 ± 9.56	4.83	**
Calcium	400	249.13 ± 96.69	14.26	**
Iron	28	7.83 ± 2.70	8.38	**

** - Significant at 1% level NS – Not Significant

As evident from the table XVV the mean nutrient intake of the selected transgenders were compared with the standard values and it was found the values are lesser than the normal values suggested by ICMR.

It was evident from the result that the selected subjects did not have enough knowledge regarding the importance of nutrition and showed one percent significance. No significance was seen in their proteins and carbohydrates intake with ICMR value.

2. Mean nutrient intake of the selected transgenders (moderate activity)

Table XXI depicts the mean nutrient intake of selected transgenders.

TABLE XXI

**MEAN NUTRIENT ANALYSIS AMONG THE SELECTED TRANSGENDERS
(N=120)**

Nutrients	Standard Values (ICMR)	Means± S.D	t Values	Significant
Carbohydrates	320	290.01 ± 64.81	0.79	NS
Energy	2875	2171.3 ± 64.81	3.54	**
Protein	60	64.35 ± 9.32	1.02	NS
Fat	20	27.27 ± 7.76	2.06	*
Fiber	40	26.89 ± 9.47	3.34	**
Calcium	400	328.56 ± 63.96	2.699	*
Iron	28	17.71 ± 5.78	4.29	**

*- Significant at 5% ** - Significant at 1% NS – Not significant

The above table XVVI indicates that intake of the transgenders have their actual intake. Fibre. Energy, Iron, these nutrients showed significance at one percent. Fat and calcium shows the significant at five percent level. The researcher found the reason for fewer intakes was due to poverty and unemployment or too heavy work load and they were more figure conscious.

3. Nutrient intake of the selected heavy activity transgenders (Heavy activity)

Table XXII depicts the mean nutrient intake of selected transgenders.

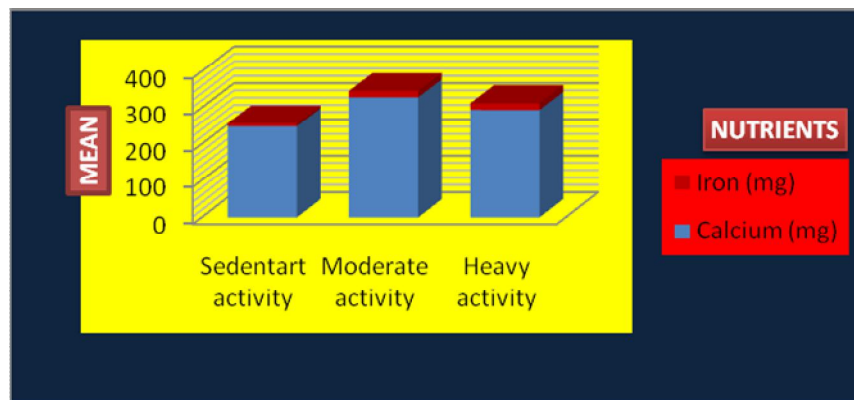
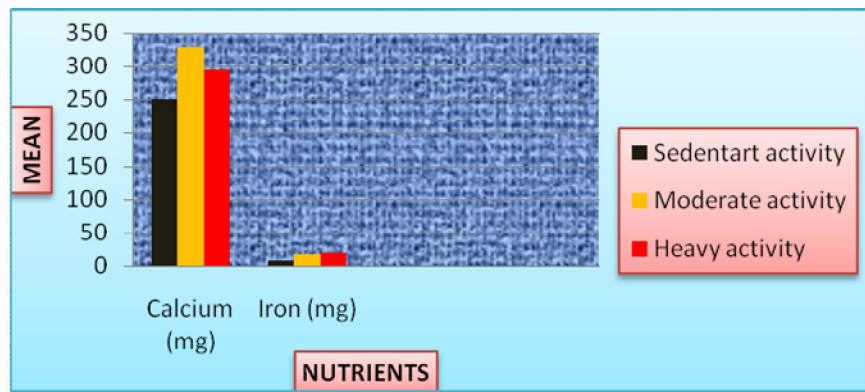
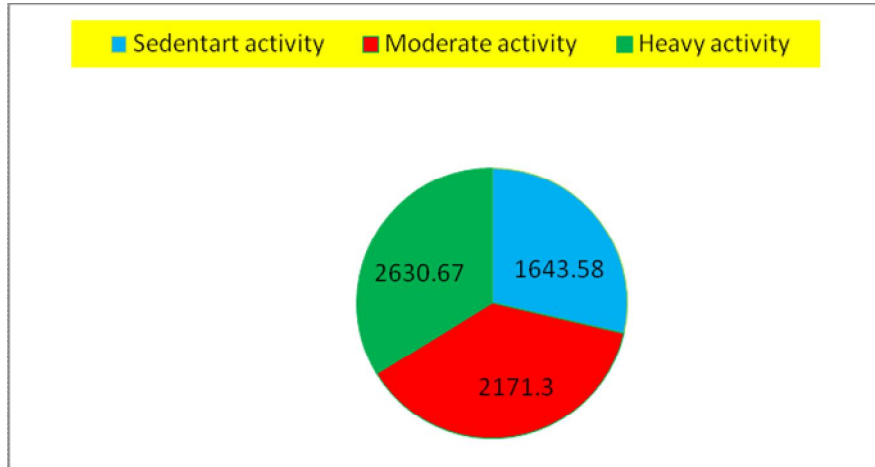
TABLE XXII
MEAN NUTRIENT ANALYSIS AMONG THE SELECTED TRANSGENDERS
(N=120)

Nutrients	Standard Values (ICMR)	Means S.D	't' Values	Significant
Carbohydrates	423	315.67 ± 78.18	6.14	**
Energy	3800	2630.67 ± 558.56	16.38	**
Protein	60	78.14 ± 20.05	3.25	*
Fat	20	27.91 ± 4.64	2.06	*
Fiber	40	25.99 ± 7.58	4.52	**
Calcium	400	294.00 ± 69.79	21.83	**
Iron	28	18.30 ± 4.56	5.19	**

* - Significant at 5% level; ** - Significant at 1% level; NS– Not significant

As evident from the table XVV the mean nutrient intakes of the selected transgenders were compared with the standard values and it was found the values are related the normal values suggested by ICMR.

It was evident from the result that the selected subjects did not have enough knowledge regarding the importance. Thus the results call for imparting nutrient education too bring about awareness and emphasize the importance of right dietary intake which are important aspects of health.



MEAN NUTRIENT ANALYSIS FOR THE SELECTED TRANSGENDERS

FIGURE 8

V SUMMARY AND CONCLUSION

Transgender is used as an umbrella to describe people who are not traditionally associated with their birth sex. They are likely to experience some form of victimization as a result of his/her transgender identity resulting in the emotional disturbances. This has an impact on the consumption pattern, thus resulting in a series of health disorders which includes diabetes, blood pressure, cancer, cardiac problems, obesity was stress many more. The main endeavor for the present study entitled.

“Assessment of Nutritional Status Of the Selected Transgenders” is to know the economical condition, the lifestyle behavior, their eating habit and the health concepts about various common disorders.

To assess the nutritional status among the selected transgenders in Coimbatore city. The area was selected through purposive sampling and the subjects were selected by the stratified sampling method. A interview schedule was formulated their background information, life style pattern and socio economical status, dietary pattern and socio economical status, dietary pattern was obtained through direct face interview. The nutritional status of the community was obtained through anthropometric measurements.

The dietary survey was conducted through 24 hour recall method for three consecutive days. The food consumption pattern like their food habits related to vegetarian or non-vegetarian, fruits, beverages, green leafy vegetables and junk food consumption pattern was also assessed.

Thus the importance of diet counseling raised to impact the importance of right dietary pattern, importance of exercise, signs and symptoms of various diseases was imparted to the subjects using charts, prepared in local language.

Results pertaining to the study are summarized as follows,

- Based on the WHO (2004), BMI classification twelve per cent of the selected transgenders were under weight, 50 per cent of selected subjects were ideal weight, 26 per cent were overweight and 19 per cent were obese among the transgenders.
- Twenty six percent and seven per cent of the selected transgenders belonged to the age group of 20-30 years who were from normal weight and underweight category respectively. Only less percent of the selected subjects were in the age group of 31-40 years.
- Twenty one per cent of the selected ideal weight transgenders had primary and middle school education. Twenty per cent and one per cent of the selected normal weight subjects respectively had higher secondary and college level education. Only six per cent of the normal BMI subject was illiterate.
- The socio economic background of the selected transgenders indicated that majority of the literates were employed. Ten per cent of the selected subjects in the age group of 20-30 years worked in private concern, thirteen per cent of the selected subjects had started business, seven per cent subjects collecting money from the shops. Three per cent subjects worked in government jobs in the age group of 20-30 years.
- Thirty per cent of the ideal weight subjects performed moderate activity like cooking, whereas fifteen per cent and four per cent of them were overweight and underweight respectively. Nine per cent of the sedentary worker had normal BMI. Six per cent of them under weight and ten per cent of the subjects were obese comes under the sedentary activity. Ten per cent of the subject were heavy worker, four per cent subjects performed moderate activity.
- Forty per cent of the normal weight subjects belonged to low income level, four per cent, 13 per cent and six per cent of the selected subjects were under weight and overweight respectively.

- Forty one per cent of the selected subjects spent 20-30 per cent on food and seven per cent of them spent more than 50 per cent of their income towards food.
- Eighty per cent of the selected subjects spent 5-10 per cent monthly on clothing and twenty per cent of them spent more than ten per cent of their purchase of cloths.
- Thirteen per cent of the selected transgenders spent less than ten per cent for education.
- Twenty nine per cent of the selected subjects spent less than five per cent toward medical expenses whereas nine per cent spent about 10-15 per cent for their medical treatment.
- Public transportation was the common mode of transportation seen among the selected transgenders. Fifty eight per cent spent 10-30 per cent of the monthly income for their mode of transportation.
- Eighty one percent of the selected transgenders use public transportation as their mode of travelling, 48 percent travelled less than half an hour, 24 percent travelled about half an hour to an hour and 20 percent about more than an hour.
- It was clear that only forty one of the selected subjects had the habit of smoking, nineteen of the subjects smoked cigarettes daily, among them nine of them smoked half a packet a day, daily 22 of the selected transgenders had the habit if smoking beedi and smoked less than half a packet.
- Fifty two of the selected subjects chewing habits, four of them used chewedpanparag daily and nine of them chewed more than five packets. Sixteen of them chewed gudka daily, ten of them have the habit of gudka chewing half a packet a day and three of them chewing more than five packets a day. Eight of the selected subjects chewed betel leaves with tobacco.
- Fifty seven of the selected transgenders had the habit of consuming alcohol. Twenty six of the selected subjects drank beer daily and nine per cent of the subjects consumed 100-250ml and five per cent of them drank above 500ml.

- Eighty two per cent of the subjects had this habit of watching television. Forty per cent watched television more than 30minutes and nine per cent watched television for about half to one hour.
- Among the selected 120 transgenders, 48 of them had snacking habits while watching television. Whereas 19 per cent snacked less than half a packet of chips. It was found that seven per cent of them 20-25 grams of samosa/cutlet and ten per cent ate more than five numbers of biscuits and three percent ate more than five numbers of biscuits and three per cent ate one to five numbers of chocolate.
- It was found that 35 per cent of the selected transgenders had the habit of when they are sad and showed their anger on food. Sixty eight per cent of the selected transgenders had the habit of eating late hours.
- Thirty two per cent of the selected transgenders were vegetarians and the rest of 88 per cent of the selected transgenders had the habit of consuming non-vegetarian foods.
- Thirteen per cent of the selected transgenders skipped breakfast daily and three per cent skipped breakfast weekly. Skipping pattern for lunch on daily, weekly and rarely was seen among six per cent, two per cent, 13 per cent respectively and only one of them had the habit of skipping dinner daily.
- Twenty six per cent of the selected transgenders consumed 8-16 glasses of water and had normal BMI, eleven per cent was overweight, four per cent of them under weight and six per cent were obese. Thirteen per cent of the ideal subjects consumed more than 16 glasses of water per day and one per cent from underweight, seven was obese.
- All the selected transgenders consumed all the types of green leafy vegetables twice a week; they consumed 100-150 grams which is inadequate.

- Banana was the most preferred fruit next to banana and apple followed by grapes, sweet lime and orange. Sixteen per cent of selected transgenders consumed banana daily and 16 per cent ate apple daily.
- Thirty per cent of the selected transgenders consumed egg daily and five per cent of them ate beef weekly, and eight of them had chicken daily.
- Beverages consumption is most common among the transgenders. They reported that beverages boost their energy and keep them active always. Thirty percent, 35 percent and 33 percent of the selected transgenders consumed tea, coffee and soft drinks daily. Among the 33 percent drank 2-3 cups and two percent about 4-5 cups of tea.
- Preferred food consumption is most common in transgenders. Thirty three per cent were consume appalam and vadakam daily.

Conclusion

The present study from the results is that the transgenders are under privileged and lack of 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 identified among them blood pressure, cancer, cardiac problems, diabetic and HIV. They undergo lots of psychological stress resulting from discrimination and ill treatment in the society.

Thus the investigator thought of educating transgenders regarding eating towards healthy foods and the correct consumption quantity and various method adopted for right cooking techniques were explained. The importance of vitamins and minerals was explained along with their quantity consumption should be thought among the transgenders.

Recommendations

- ✓ Health education should be provided to the transgenders before the transition process.
- ✓ The various health hazards of hormonal therapy should be imparted.
- ✓ A positive eating pattern should be followed to lead a positive living.

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APPENDIX 1

PREVALENCE OF NUTRITIONAL STATUS AMONG TRANSGENDER AND IMPACT OF NUTRITIONAL EDUCATION

1. SOCIO ECONOMIC STATUS:

1. Name:

2. Age:

3. Address:

4. Contact no :

5. Email-id :

6. Educational Qualification:

High school	Higher secondary	Undergraduate	Postgraduate	Illiterate

7. Occupational Status :

- a) Government employee b) Private company c) Business
d) Sex work e) Collection of money from shops
f) Temple work g) Unemployed h) Anyother

8. Type of activity followed :

- a) Sedentary b) Moderate c) Heavy

9. Total monthly income :

- a) Low income b) Middle income c) High income
(Rs. 2500-4500) (Rs. 4500-7500) (>7500)

10. Background information of the family:

S.no	Name of the family members	Relationship with the patient	Age (yrs)	Education	Occupation	Income

11. Expenditure Pattern:

S.No	Details	% of Expenditure
1.	Food	<20
		20-30
		30-40
		40-50
		>50
2.	Clothing	0-5
		5-10
		>10

13. The mode of transportation to your place?

Mode	Duration
Walking	
Cycling	
Public transportation	
Two wheeler	
Four wheeler	

III.LIFE STYLE AND DIETARY PATTERN

1. Do you have the habit of smoking?

Yes No

If yes,

Type	No. per day
cigarettes	
Beedi	
Any other	

2. How long do you have the habit of smoking?

a)1 year b)1-5 year c)>5 years

3. Do you have the habit of chewing the following items?

a)Yes b)No

If yes,

Habit	No. of packets	Frequency			
		Daily	Daily twice	Weekly twice	Weekly
Gudka					
Pan parag					
Tobacco					
Any other					

4. Do you consume alcohol?

a) Yes

b) No

If yes,

Type	Quantity	Frequency		
		Daily	Weekly	occasionally
Whiskey				
Wine				
Beer				
Toddy				
Any other				

5. Do you have the habit of watch television ?

a) Yes

b) No

6.. How many hours do you spend in front of television?

a)<30 min b)1 hour c)>1 hour

7. Do you have the habit of eating while watching television?

a)Yes b)No

If yes,

Items	Quantity
Chips	
Chocolates	
Samosa/cutlet	
Pizzas/burger	
Bakery foods	
Any other	

8. Do you have the habit of eating during emotional disturbances?

a)Yes b) No

9. Do you have the habit of eating during late hours?

a)Yes b) No

10. Do you have the habit of napping after meals?

a)Yes b)No

III. DIETARY PATTERN

1. Diet pattern:

a) Vegetarian c) Non vegetarian

2. Do you follow strict meal timing?

a)Yes b) No

3. Do you skip meals?

a)Yes b)No

If yes,

Meal	Food items	Frequency				Reason for skipping
		Daily	Weekly once	Weekly	Rarely	

4. Type of Meal pattern:

a) <than 2

b) 3

c) > than 3

5.No of glasses of water consumed per day

a)8 Glasess.

b) 8-15 Glasess

c)than 15 Glasess

6. Frequency of fruits consumption?

Fruits	Quantity	Frequency		
		Daily	Weekly	Occasionally
Apple				
Banana				
Guava				
Grapes				
Musambi				
Orange				

Papaya				
Pomegranate				
Sapota				
Mango				
Musk melon				
Jack fruit				
Amla				
Pineapple				

7. consumption of green leafy vegetable?

Green leafy vegetable	Quantity (g)	Frequency		
		Daily	Weekly	Occasionally
Agathi				
Amaranth				
Fenugreek				
Manathakkali				
Mint				
Spinach				

8. consumption of beverages?

Type of beverages	Quantity (ml)	Frequency		
		Daily	Weekly	Occasionally

Coffee				
Tea				
Milk				
Health drinks				
Soft drinks				

9. Fleshy food consumption?

Types of fleshy foods	Quantity (g)	Frequency		
		Daily	Weekly	rarely
Beef				
Chicken				
Egg				
Fish				
Meat				
Any other				

10. Do you have the habit of taking preserved foods?

a) Yes b)No

If yes,

Items	Quantity (g)	Frequency		
		Daily	Weekly	Occasionally
Jam				
Pappad				
Pickle				
Dried fish				
Dried meat				

ASSESSMENT OF NUTRITIONAL STATUS

1. Anthropometric measurements

Weight (kg)	Height (cm)	BMI	Waist (cm)	Hip (cm)	WHR

2. Diet during illness and specific condition?

Illness	Food given	Reason	Foods avoided	Reason
Fever				
Diarrhea				
Chicken pox				
Cold				
Typhoid				
Measles				
Other				

3 days recall pattern?

Days	Early morning	Breakfast	Mid morning	Lunch	Evening	Dinner
1 st day						
2 nd day						
3 rd day						

APPENDIX-II

Mean Nutrient Analysis among the selected sedentary activity Transgender

Nutrients	Standard Values (ICMR)	Means S.D
CHO	270	250.50 ± 86.57
Energy	2425	1643.38 ± 488.01
Protein	60	53.80 ± 16.79
Fat	20	40.92 ± 24.22
Fiber	40	14.66 ± 9.56
Calcium	400	249.13 ± 96.69
Iron	28	7.83 ± 2.70

APPENDIX-III

Mean Nutrient Analysis among the selected the Moderate activity Transgender

Nutrients	Standard Values(ICMR)	Means S.D
CHO	320	290.01 ± 64.81
Energy	2875	2171.3 ± 64.81
Protein	60	64.35 ± 9.32
Fat	20	27.27 ± 7.76
Fiber	40	26.89 ± 9.47
Calcium	400	328.56 ± 63.96
Iron	28	17.71 ± 5.78

APPENDIX-IV

Mean Nutrient intake among the Heavy Work Transgenders

Nutrients	Standard Values (ICMR)	Means S.D
CHO	423	315.67 ± 78.18
Energy	3800	2630.67 ± 558.56
Protein	60	78.14 ± 20.05
Fat	20	27.91 ± 4.64
Fiber	40	25.99 ± 7.58
Calcium	400	294.00 ± 69.79
Iron	28	18.30 ± 4.56

