Epidemiology of non-communicable diseases among transgender population residing in Chennai district, Tamil Nadu

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Abstract

Introduction: There is a paucity of research on non-communicable diseases (NCDs) like diabetes, hypertension and coronary heart diseases among transgenders, with more importance given to diseases like HIV. The study was undertaken to determine the prevalence of NCDs, their risk factors and the associated factors among transgenders residing in Chennai district, Tamil Nadu. **Methodology:** This is a descriptive cross-sectional study done among 145 transgenders residing in the Chennai district, Tamil Nadu, selected by snowball sampling method. Data were collected by a pre-tested semi-structured questionnaire, anthropometric data were measured, and blood pressure was measured by a mercury sphygmomanometer using standard protocols. Data were entered in Excel software and analysed by using SPSS version 25. **Results:** The mean age of the study participants was 36 ± 4.2 years. Nearly 91% had only up to school education. Around 26.7% suffered from type 2 diabetes mellitus, 15.1% had a history of hypertension, 36.3% were newly diagnosed hypertensives, and 13.9% were overweight/obese. Almost 40% were either current tobacco or alcohol consumers. There was a statistically significant association found between overweight/obesity and education, work, and income of study participants. **Conclusion:** The high prevalence of NCDs among the study participants warrants health education among transgenders to get screened for common NCDs. Further research is needed to understand the risks of NCDs among transgenders.

Keywords: Alcohol, cisgender, diabetes, hypertension, stroke, tobacco

Introduction

Globally, non-communicable diseases (NCD) are one of the significant causes of mortality and morbidity. NCD refers to conditions that are chronic in nature and lead to long-term problems and are often preceded by long-term treatment and care. The major NCDs of concern include diabetes, hypertension, malignancy, cardiovascular diseases (CVDs), and chronic lung illnesses.[1] NCDs are responsible for 15 million deaths between the age group of 30 and 69 years. CVDs are responsible for the most significant number of NCD deaths. Factors like tobacco consumption, physical inactivity, harmful alcohol use, and unhealthy dietary pattern serve to increase the risk of mortality due to NCDs.[2]

Access this article online

Quick Response Code:

Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_1751_22

How to cite this article: Prasanth BK, Eashwar VM, Mahalakshmi K, Ramachandran K. Epidemiology of non-communicable diseases among transgender population residing in Chennai district, Tamil Nadu. J Family Med Prim Care 2023;12:762-7.

Transgender (TG) is used to identify persons whose gender identity or expression differs from the sex assigned at birth. Gender identity refers to the internal understanding of a person's own gender, and gender expression refers to the outward expression of their gender. Cisgender persons are those whose sex assigned at birth conforms to their gender identity or expression.[3]

TG people are subjected to social stigma, stress, and health inequity, developing behavioural risk factors like substance abuse and unhealthy diets.[4] Monitoring of risk factors needs to take top priority among TG people as they are high-risk groups for developing NCDs. Most of the studies done on the TG population focus on stigma, discrimination, HIV, and sexually transmitted infections.[5,6] Chronic diseases like NCDs have a paucity of literature among TGs.[7,8] Based on the available literature, there is a disparity in the prevalence of chronic diseases and their risk factors between the TG and cisgender populations. More research is needed to address the issues and understand the causes of the increased incidence of NCDs among the TG population.[9] The significant barriers include discrimination and hostility they face within the healthcare system, because of which they either delay or forego healthcare visits.[10]

Based on the above background, the study was done among TGs in the Chennai district, with the main objective to find out the prevalence of NCDs and their risk factors.

Methodology

Study setting

TG people above 18 years of age residing in Chennai district, Tamil Nadu.

Study duration

The study was carried out between the period of February and April 2022.

Study design

Descriptive cross-sectional study.

Sample size and sampling

A non-government organization catering to the needs of TGs was approached, and details about TG under their care were collected from them. Through snowball sampling, 145 TGs were approached, and data were collected from them.

Data collection

Data were collected using a pretested semi-structured questionnaire containing details about the socio-demographic characteristics, self-reported NCDs like type 2 diabetes mellitus (T2DM), hypertension, CVDs, history of any Cerebrovascular accidents (CVAs), and risk factors of NCDs like current alcohol/tobacco consumption (usage in past 6 months). Data were collected through face-to-face interviews, and the investigator filled out the questionnaire based on the participants' responses. Blood pressure was measured by using a mercury sphygmomanometer in the right arm with the participant in a sitting position and the arm being placed at the level of the heart. Two readings of blood pressure were recorded and the average was taken. A reading above 140/90 mm Hg was classified as hypertension.[11]

Anthropometric measurements like height, weight, waist, and hip circumferences were used to calculate body mass index (BMI) and waist–hip ratio. The revised guidelines for the Asian population categorize overweight as a BMI between 23.0–24 and obesity as a BMI $\geq$25.[12] A waist–hip ratio above 0.90 was taken as a cut-off point for the risk of developing metabolic complications as per WHO.[13]

Data analysis

Data were entered in Microsoft Excel and analysed using SPSS version 22. Descriptive statistics were used to present data in tables, and Chi-square was used to find the association between NCD risk factors and related variables.

Ethical approval and informed consent

Ethical approval was obtained from the Institutional Ethical Committee of the private medical college. Written informed consent was obtained in the local language of the participant before including them in the study.

Results

Table 1 shows the socio-demographic details of the study participants. Around half of the study, participants were in the age group of 26–40 years of age. The majority of the participants were Hindus. Around 64.2% had education up to the school level, and 26.7% were illiterate. According to the HUDCO income classification, around one-third of the participants belonged to the middle-income category [Table 1].

From the present study, more than one-fourth of the participants were current alcohol and tobacco consumers, respectively. Table 2 shows the prevalence of NCD risk factors among the study participants [Table 2].

Regarding NCDs, around one-fourth of the participants suffered from T2DM, and the prevalence of other NCDs and related factors is given in Table 3.

Table 4 shows the association between overweight/obesity and related variables. It was found that education, nature of their work, and income had a statistically significant association with overweight/obesity with $P < 0.05$. It was found that more than two-thirds of those who were overweight/obese were either begging or involved in sex-related work [Table 4].

Table 1: Socio-demographic details of the study participants		
Variable	**Frequency**	**Percentage**
Age		
<25 years of age	38	23.0
26-40 years	79	47.9
>40 years	48	29.1
Religion		
Hindu	157	95.2
Christian	8	4.8
Education		
Illiterate	44	26.7
Up-to-school education	106	64.2
Graduate/Diploma	15	9.1
Occupation		
Not doing any work	17	10.3
Begging	93	56.4
Sex-related work	33	20
Salaried work	22	13.3
HUDCO income classification		
Low income	25	15.2
Middle income	117	70.9
High income	23	13.9

Table 2: Prevalence of NCD risk factors among the study population		
Variable	**Frequency**	**Percentage**
Current alcohol consumption		
Yes	64	34.8
No	111	67.3
Current tobacco consumption		
Yes	69	41.8
No	96	58.2
Waist-hip ratio		
>0.9	51	30.9
<0.9	114	69.1
Body-mass index		
Overweight/Obese	32	19.4
Normal	133	80.6
Diet		
Unhealthy/Junk food diet	48	29.1
Healthy diet	117	70.9
Family history of NCD		
Yes	39	23.6
No/Not known	126	76.4
Physical activity		
Physically inactive	59	35.8
Physically active	106	64.2

Around half of the participants who were current tobacco/alcohol consumers were involved in begging. The majority of those who had education only up to school level were found to be tobacco/alcohol consumers. Education, work, and income were found to have a statistically significant association with alcohol/tobacco consumption with a *P* value < 0.05 [Table 5].

Discussion

Importance of NCDs in TG population

Among the TG population, HIV and other sexually transmitted diseases (STD) are given more importance due to the high prevalence, but chronic diseases like diabetes and hypertension are usually given less attention. It is imperative to understand that the TG population has similar risk factors like other genders leading to the development of NCDs. The results of the study done among the selected population of TG people in the Chennai district are discussed below.

Prevalence of T2DM in TG population

The prevalence of self-reported diabetes mellitus among the study participants was 26.7%. In a similar study done by Madhavan M *et al.*[14] among TG people in the Puducherry district, the prevalence of self-reported T2DM was 8%. In a study by Sivakami *et al.*[15] in Coimbatore, the prevalence of T2DM was 3%. Even among the average population of Puducherry, the prevalence was found to be 5.7%.[16] In a study by Pharr JR *et al.*,[17] 15.4% of participants had diabetes. These findings might have been due to the difference in the socio-demographic characteristics of the study participants and the higher mean age of the participants in the present study. Since diabetes is self-reported in the present study, the real burden of T2DM is unknown. Many participants must be screened for T2DM due to other risk factors like overweight and obesity.

Prevalence of hypertension in TG population

In the present study, 15.1% of the participants were known cases of hypertension and were on medication. Around 36.3% were newly diagnosed cases of hypertension. Similar findings were reported in a study done among TG people in Coimbatore in which 15% of the participants suffered from hypertension.[15] In a study by Shenoy VV *et al.*,[18] 11.1% of the TG participants were known cases of hypertension. These findings highlight the high prevalence of hypertension among TGs and the need to screen them for hypertension, as the present study found that the newly diagnosed hypertensives were 36.3% of the study population.

Prevalence of stroke and coronary heart disease in TG population

The prevalence of stroke and coronary heart disease among the study population was 13.9% and 7.3%, respectively. In a study done by Pharr JR *et al.*,[17] it was 6.5%. TG people usually take hormonal therapy to exhibit gender characteristics, which may increase the risk of coronary heart disease, as evident from a study done by Streed *et al.*[19] This prevalence is also higher when compared to population-based studies done among the general population in India.[20,21] These findings warrant the need for health education among TGs on the cautious use of hormone medications and screening for diseases like hypertension and heart disease periodically.

Association between NCDs and related risk factors

According to the present study, employment, education, and the working environment served as important factors for the development of risk factors for NCDs like overweight and alcohol/tobacco usage. Around 29.1% of the study participants follow an unhealthy dietary pattern, and 35% are physically inactive. In a study by Madhavan *et al.*,[14] 84% were physically inactive and 34% consumed junk food. These findings necessitate further research in this domain to identify the social and cultural causes of the emergence of these risk factors among TGs.

In the present study, 19.4% of participants were overweight/obese. The waist–hip ratio was also higher in 30.9% of the study participants. Similar results were obtained in studies conducted by Shenoy VV *et al.*[18] and Sridevi Sivakami *et al.*[15] Since TGs are mostly involved in begging and sex-related work like

prostitution, they are more bound to suffer from psychological problems like depression which could lead to disordered eating patterns like binge eating.[22] A study done by Boehmer *et al.*[23] found that pre-obesity and obesity are more common in TGs when compared to the general population. This, in turn, leads to overweight and obesity among them, which could lead to the development of NCDs like T2DM and hypertension.

In the present study, current alcohol consumers were 34.8%, and tobacco consumers were 41.8%. It is a known fact that tobacco and alcohol serve as important risk factors for diabetes, hypertension, and coronary heart diseases.[24] A national survey by Buchting FO *et al.*[25] among TGs found that alcohol and tobacco usage among TGs was higher compared to the cisgenders.[26] Since TGs face a lot of stigma and discrimination in society, they are more prone to involve in substance abuse as a cope-up strategy.

Strengths and limitations of the present study

The major strength of the present study is that this is among one of the few studies done in India, exploring the prevalence of NCDs and associated risk factors among the TG population, as most of the other studies concentrated more among the HIV and STD among the TGs. As TGs do not have a proper sampling frame in India, the external validity of the study is limited as non-probability sampling technique was used.

Conclusion

The present study found the prevalence of NCDs and their risk factors among TGs to be high which is a cause of concern as they seldom go the healthcare workers due to their low self-esteem and lack of self-care. This could lead to the common NCDs being undiagnosed leading to significant mortality and morbidity. Primary care physicians must be made aware that TGs' healthcare needs include not only care related to STDs but

Table 3: Prevalence of NCD and related factors among the study population

Variable	Frequency	Percentage
Type 2 diabetes mellitus		
Yes	44	26.7
No	121	73.3
Hypertension		
Yes	80	48.5
Known case	25	15.1
Newly diagnosed	60	36.3
Cerebrovascular accidents (stroke)		
>0.9	12	7.3
<0.9	153	92.7
Coronary artery disease		
Overweight/Obese	23	13.9
Normal	142	86.1
NCD-related eye complications		
Yes	18	11
No	147	89

Table 4: Association between obesity and related variables

Variable	Overweight/Obesity *n*=32		Normal *n*=133		Total *n*=165		Chi-square	*P*
	n	%	*n*	%	*n*	%		
Age (in years)								
<25	8	25	30	22.6	38	23	0.272	0.873
26-40	14	43.8	65	48.9	79	47.9		
>40	10	31.3	38	28.6	48	29.1		
Highest education								
Illiterate	14	43.8	30	22.6	44	26.7	6.663	0.036*
School	17	53.1	89	66.9	106	64.2		
Graduate/Diploma	1	3.1	14	10.5	15	9.1		
Nature of work								
Unemployed	4	12.5	13	9.8	17	10.3	9.655	0.022*
Begging	17	53.1	76	57.1	93	56.4		
Sex-related work	11	34.4	22	16.5	33	20		
HUDCO income								
Low income	1	3.1	24	18	25	15.2	38.67	0.000*
Middle income	17	53.1	100	75.2	117	10.9		
High income	14	43.8	8	6.0	23	13.9		

*P<0.05, Statistically significant at 95% Confidence interval

Table 5: Association between alcohol/tobacco consumption and related variables								
Variable	Alcohol/Tobacco consumption *n*=85		Alcohol/Tobacco consumption *n*=80		Total *n*=165		Chi-square	*P*
	n	%	*n*	%	*n*	%		
Age (in years)								
<25	24	22.2	14	24.6	38	23.0	2.196	0.334
26-40	56	51.9	23	40.4	79	47.9		
>40	28	25.9	20	35.1	48	29.1		
Highest education								
Illiterate	36	33.3	8	14.0	44	26.7	7.10	0.029*
School	63	58.3	43	75.4	106	64.2		
Graduate/Diploma	9	8.3	6	10.5	15	9.1		
Nature of work								
Unemployed	17	15.7	0	0	17	10.3	11.71	0.008*
Begging	58	53.7	35	61.4	93	56.4		
Sex-related work	22	20.4	11	19.3	33	20.0		
HUDCO income								
Low income	18	16.7	7	12.3	25	15.2	2.935	0.230
Middle income	72	66.7	45	78.9	117	70.9		
High income	18	16.7	5	8.8	23	13.9		

*P<0.05, Statistically significant at 95% Confidence Interval

also early detection and management of NCDs have to be kept a priority among them. Health education and targeted intervention measures must target TGs to create awareness about NCDs and improve their health-seeking behaviour.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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