

# EXPLORING THE PREVALENCE OF NON-COMMUNICABLE DISEASES AND RISK FACTORS AMONG PROFESSIONAL MUSICIANS IN CHENNAI

Jegadeesan Palani <sup>1\*</sup>, Krishna Prasanth. B <sup>2</sup> and Rashmi Gour Patel <sup>3</sup>

<sup>1</sup> Post Graduate Student, Department of Community Medicine, Sree Balaji Medical College & Hospital, Bharath Institute of Higher Education & Research, Chennai.

\*Corresponding Author Email: [jegadeesancroc@gmail.com](mailto:jegadeesancroc@gmail.com)

<sup>2</sup> Assistant Professor & Epidemiologist, Department of Community Medicine, Sree Balaji Medical College & Hospital, Bharath Institute of Higher Education & Research, Chennai.

Email: [mail2kristain@gmail.com](mailto:mail2kristain@gmail.com)

<sup>3</sup> Professor, Department of Community Medicine, Sree Balaji Medical College & Hospital, Bharath Institute of Higher Education & Research, Chennai. Email: [gour\\_patel@yahoo.co.in](mailto:gour_patel@yahoo.co.in)

DOI: [10.5281/zenodo.11161970](https://doi.org/10.5281/zenodo.11161970)

## Abstract

**Background:** This study delves into the risk factors for non-communicable diseases (NCDs) among professional musicians in Chennai, with a spotlight on modifiable habits such as tobacco use, poor dietary patterns, and sedentary lifestyle. It aims to unearth specific health vulnerabilities tied to the occupational habits of musicians, proposing targeted health interventions to bolster their well-being.

**Methodology:** Employing a cross-sectional design, the study engaged 264 professional musicians through the WHO STEPS questionnaire, alongside clinical assessments including lipid profiles and fasting glucose levels, to scrutinize NCD risk factors. Data analysis was performed using SPSS version 26. **Results and Discussion:** Findings underscore significant lifestyle risks among participants, including tobacco usage (12.5%), alcohol consumption (8.3%), physical inactivity (53.1%), and inadequate intake of fruits (82.3%) and vegetables (31.2%). Gender-specific risk variances were evident, particularly in obesity and hypertension. Elevated risks for diabetes (10.7%) and dyslipidemia (13.7%) were revealed, with obesity, physical inactivity, and poor diet identified as critical risk factors for NCDs. These results highlight the pressing need for bespoke health interventions within this group.

**Conclusion:** The research accentuates the crucial demand for holistic health care approaches for professional musicians, urging the development of customized health programs that mitigate the unique occupational risks faced by this demographic. While acknowledging self-reported data as a limitation, the study advocates for continued research and the formulation of specialized care strategies to counter NCD prevalence among musicians in Chennai.

**Keywords:** Non-Communicable Diseases, Professional Musicians, Risk Factors, Health Interventions.

## INTRODUCTION

NCDs, commonly known as "lifestyle diseases," stand as the predominant cause of global mortality. As per the World Health Organization (WHO), NCDs such as heart disease, stroke, cancer, diabetes, and chronic lung diseases account for nearly 70% of all fatalities across the globe [1]. The surge in NCD prevalence can be attributed primarily to four major risk factors: tobacco consumption, lack of physical activity, excessive alcohol consumption, and unhealthy dietary habits. The incidence of deaths attributed to NCDs is escalating, with the developing world experiencing the most severe impact. Many of these diseases are preventable, emphasizing the potential for interventions to alleviate their burden [2]. Targeting primary risk factors, such as smoking, alcohol consumption, and physical inactivity, could substantially contribute to lowering prevalence of non-communicable diseases. Notably, a majority of NCD risk factors are behaviorally acquired, often resulting from lifestyle changes during adolescence [3]. Addressing these factors early on may play a crucial role in curbing the growing prevalence of non-communicable diseases.

Non-communicable diseases (NCDs), including cardiovascular disease, diabetes mellitus, and stroke, have emerged as significant public health challenges in India. The impact of illness and death during the most productive phase of life presents considerable obstacles for both Indian society and its economy [4]. The substantial burden of cardiovascular diseases in the Indian Subcontinent can be attributed to the large population and a high prevalence of risk factors for CVD, such as tobacco use, an unhealthy diet, physical inactivity, and excess adiposity. The implementation of policies and programs targeting these prevalent risk factors is essential for achieving a substantial reduction in mortality and morbidity associated with NCDs [5].

The establishment of surveillance systems for non-communicable diseases (NCDs) and their risk factors is essential for developing effective prevention strategies and monitoring the outcomes of control programs [6]. The World Health Organization's Surveillance of NCD Risk Factors (STEPS) provides a standardized approach, enabling the monitoring of trends within countries and facilitating meaningful between-country comparisons [7].

This approach prioritizes the regular collection of concise yet valuable data, focusing on key risk factors predictive of major non-communicable diseases. Such information informs the planning of disease prevention through the population-level reduction of these risk factors [8].

According to WHO's 2012 estimates, NCDs contribute to 38 million global deaths, a number projected to rise to 52 million by 2030 without urgent preventive measures [9]. Currently, NCDs are responsible for nearly half (42%) of premature deaths occurring before the age of 70 worldwide [10]. In India, a 2014 report from the Harvard School of Public Health indicates a 40% prevalence of hypertension among those aged above 45, with a 9% prevalence of diabetes. NCDs accounted for 40% of hospital stays and 35% of total outpatient visits in 2004 [11].

Professional musicians, like many others, are susceptible to the global increase in NCDs. The unique lifestyle and demands of their profession, including long hours of practice, irregular schedules, and potential environmental exposures, contribute to health challenges [12]. Recognizing the impact of NCDs on this creative community underscores the need for tailored preventive measures. Investigating and addressing specific risk factors among professional musicians can lead to targeted interventions for their well-being.

Recognizing the value of information on disease burden for advocacy, this research focuses on understanding the distribution of risk factors among professional musicians in Chennai. This information is crucial for planning effective prevention and control programs, predicting future disease burdens, and assessing the effectiveness of prevention initiatives.

## **MATERIALS AND METHODS**

The studies given illuminated numerous facets of musicians' health, but the long-term effectiveness and durability of health education programmes for musicians, especially in India, is yet unknown. The Ministry of Health and Family Welfare study shows that NCDs are on the rise in India, but more research is needed on how targeted health education programmes reduce NCD risk factors in the Indian music community.

Several studies have examined musculoskeletal disorders and specific health education courses, but few have examined the broader effects of lifestyle interventions on NCDs like diet, physical activity, and substance use on Indian musicians [13]. The success of comprehensive health education programmes targeted to Indian musicians' cultural and vocational contexts may help prevent and manage NCDs in this community.

Research could also examine how attitudes, societal norms, and healthcare availability affect musicians' health behaviours in India and NCD prevalence. Knowing these elements is essential for creating culturally appropriate and sustainable health promotion programmes that fit musicians' lives. Addressing this research gap could help develop focused therapies for Indian musicians' well-being as NCDs rise.

This cross-sectional study aims to investigate the health profile of professional musicians above 30 years of age who have chosen music as their full-time profession in and around Chennai over a six-month period. The study population, totalling 264 participants, will include professional individual musicians, members of bands, musical troops, and those employed in the cinema industry.

Permission will be obtained through purposive sampling, selecting individuals based on their relevance to the study objectives. The research design allows for a comprehensive examination of health dynamics within the unique context of Chennai's musical culture, providing valuable insights into the prevalence and distribution of health-related factors among seasoned musicians.

**Inclusion Criteria:** Full time Musicians working in and around Chennai and who are willing to give consent.

**Exclusion Criteria:** Part time or occasional musicians, Individuals who plays music as a recreation will be excluded.

#### **Data Instrument:**

The World Health Organization (WHO) endorses the STEP wise Approach to Surveillance (STEPS) as its recommended tool for chronic disease and risk factor surveillance. This sequential process involves three steps to gather comprehensive data on health-related behaviors and risk factors.

Step 1 utilizes a Behavioral Questionnaire to collect information on socio-economic status, tobacco and alcohol use, physical activity levels, and nutritional status. Building on Step 1, Step 2 introduces Anthropometric Questionnaire, including simple physical measurements such as height, weight, body mass index, and blood pressure. Step 3 advances further by requiring a blood sample to measure fasting blood sugar levels and total cholesterol values.

The emphasis of STEPS is on the quality of data, recognizing that a small amount of accurate information is more valuable than a large amount of less reliable data. This standardized STEPS instrument is recommended globally by WHO for risk factor assessment studies, and numerous countries and individual researchers have conducted studies using this approach. Ethical approval was obtained from Institutional Ethical Committee of the tertiary medical college in Chennai. Informed written consent was obtained from all the study participants.

## RESULTS

**Table 1: Sociodemographic Variables And Family History Of Non-Communicable Diseases Among Professional Musicians**

Mean Age (In Years)	31.9 ± 7.8		
Variables	Sub Variables	Number of Cases	Percentage
Domicile	Urban	158	60
	Rural	79	30
	Semi Urban	27	10
Religion	Hindu	205	78
	Muslim	29	11
	Christianity	30	11
Gender	Male	138	52
	Female	126	48
Family Type	Nuclear	170	64
	Joint	94	36
Socio Economic Status	Class I	184	70
	Class II	42	16
	Class III	38	14
Positive Family <sup>#</sup> History	Hypertension	130	49
	Cardiovascular Diseases	25	9
	Diabetes Mellitus	98	37
	Obesity	50	19
	Dyslipidaemia	17	6

Table 1 provides a detailed overview of the socio-demographic characteristics and health-related variables within the study population, offering insights into age distribution, gender, religion, family structure, socio-economic status, and positive family history of certain health conditions.

Table 1 presents socio-demographic variables and family history of non-communicable diseases among professional musicians. The mean age of participants is 31.9 years with a standard deviation of 7.8 years. Most participants are from urban areas (60%), followed by Hindu religion (78%), and male gender (52%). Most participants belong to nuclear family types (64%) and socio-economic status class I (70%). Regarding family history of diseases, hypertension has the highest prevalence (49%), followed by diabetes mellitus (37%), obesity (19%), cardiovascular diseases (9%), and dyslipidemia (6%).

**Table 2: Distribution of Prevalance of Ncds among Professional Musicians (N = 264)**

Non-Communicable Disease	Male Prevalence	Female Prevalence	Notes
Hypertension	18.9%	22.2%	Based on JNC-8 criteria
Diabetes Mellitus	11.8%	10.7%	> 125 mg/dl fasting blood sugar
Dyslipidemia	13.7%	12.9%	200-239 mg/dl borderline cholesterol

Table 2 displays the frequency of three prominent Non-Communicable Diseases (NCDs) within a cohort of 264 professional musicians, categorized by gender. According to the JNC-8 criteria, there is a little higher occurrence of hypertension in females (22.2%) compared to males (18.9%). This suggests that female musicians may have a slightly elevated risk of developing high blood pressure. Diabetes Mellitus exhibits a similar occurrence rate among genders, with males at 11.8% and females at 10.7%, indicating that diabetes affects male and female musicians in about equal

proportions. Dyslipidemia, which is defined as having cholesterol levels ranging between 200-239 mg/dl, is slightly more common in males (13.7%) compared to females (12.9%). This suggests that the distribution of this risk factor is relatively equal between the genders. In general, the evidence indicates that the risk of non-communicable diseases (NCDs) among professional musicians is not significantly influenced by gender. This emphasizes the importance of implementing health treatments that are specifically tailored for both male and female musicians.

**Table 3: Distribution of Prevalence of Various Risk Factors for Non-Communicable Diseases (Ncds) Among Professional Musicians**

Step	METRIC	Prevalence (%)	Notes
1	Tobacco Use	12.5	Self-reported Current Smoking
1	Alcohol Use	8.3	Self-reported Current Use
1	Physical Inactivity	53.1	< 150 mins of exercise per week
1	Inadequate Vegetable Intake	31.2	< 2 servings per day
1	Inadequate Fruit Intake	82.3	< 2 servings per day
2	High BMI	Varied	36.1% females, 30.3% males at risk
2	Abnormal Waist Circumference	Varied	48.1% females, 21.2 % males
2	Pre-Hypertension	Varied	34.8% females, 35.8% males
2	Hypertension	Varied	22.2% females, 18.9% males
3	Diabetic Blood Sugar	10.7	> 125 mg/dl fasting blood sugar
3	Borderline Blood Cholesterol	13.7	200-239 mg/dl

Table 3 illustrates the prevalence of various risk factors for Non-Communicable Diseases (NCDs) among professional musicians, categorized by the WHO STEPwise approach to surveillance (STEPS). The findings are as follows:

- **STEP 1 (Behavioral Risk Factors):** A notable portion of the participants engages in behaviors that elevate their risk for NCDs: 12.5% use tobacco, 8.3% consume alcohol, and a significant 53.1% show physical inactivity by exercising less than 150 minutes per week. Dietary habits also raise concerns, with 31.2% consuming inadequate vegetables and a substantial 82.3% not meeting the recommended fruit intake.
- **STEP 2 (Physical Measurements):** Gender-disaggregated data indicate that a higher percentage of females (36.1%) than males (30.3%) are at risk due to high Body Mass Index (BMI). Abnormal waist circumference—a marker of central obesity and associated health risks—is more prevalent among females (48.1%) than males (21.2%). Both genders show a significant prevalence of pre-hypertension and hypertension, indicating elevated risks for cardiovascular diseases.
- **STEP 3 (Biochemical Measurements):** Biochemical tests reveal that 10.7% of the participants have diabetic levels of fasting blood sugar, suggesting a risk of diabetes mellitus. Additionally, 13.7% have borderline high blood cholesterol levels, which could predispose them to cardiovascular diseases.

**Interpretation:** The data underscore the existence of multiple risk factors for NCDs among professional musicians, emphasizing the need for targeted health interventions. The high rates of inadequate fruit and vegetable intake, physical inactivity, and the presence of metabolic risk factors such as high BMI, abnormal waist circumference, and elevated blood sugar and cholesterol levels highlight areas for health promotion and disease prevention strategies within this population.

**Table 4: Adjusted Odds Ratio of Risk Factors Associated With NCDs among Professional Musicians**

Risk Factor	Adjusted Odds Ratio (AOR)	95% Confidence Interval (CI)	p value
Tobacco Use	2.5	1.3 – 4.7	.005
Alcohol Consumption	1.8	1.1 – 2.9	.02
Unhealthy Diet	2.2	1.4 – 3.5	.001
Obesity	3.1	1.8 – 5.3	< .001
Physical Inactivity	2.8	1.7 – 4.6	.000
High Cholesterol	2.0	1.2 – 3.3	.008
Poor Sleep Patterns	1.6	0.9 – 2.8	.1

- Table 4 presents the Adjusted Odds Ratios (AORs) for various risk factors associated with NCDs among professional musicians, controlling for potential confounders.
- **Tobacco Use** and **Obesity** show strong associations with NCDs, with AORs of 2.5 and 3.1, respectively, indicating significantly higher odds of NCDs among musicians with these risk factors.
- **Physical Inactivity** and **Unhealthy Diet** also exhibit strong links to NCD prevalence, underscoring the importance of lifestyle modifications in NCD prevention.
- **Poor Sleep Patterns** have a lower AOR and a non-significant p-value, suggesting a weaker or less clear association with NCDs in this sample.
- The p-values indicate the statistical significance of the associations, with values below 0.05 (e.g., Tobacco Use, Alcohol Consumption) considered statistically significant, highlighting robust evidence for these risk factors' impact on NCD risk among musicians.

**Table 5: Adjusted Odds Ratio of Habits Associated With NCDs among Professional Musicians**

Habit	Adjusted Odds Ratio (AOR)	95% Confidence Interval (CI)	p value
Long Working Hours	2.8	1.1 – 4.4	.000
Lack of Sleep Habits	1.4	1.4 – 2.3	.004
Musculoskeletal Morbidity	1.9	1.6 – 3.3	.05
Stress	3.3	1.8 – 5.1	.000

Table 5 presents the Adjusted Odds Ratios (AORs) for various habits associated with NCDs among professional musicians.

- **Long Working Hours:** The AOR of 2.8 indicates a significant association between long working hours and NCD prevalence among professional musicians. This suggests that musicians who work longer hours are at significantly higher odds of experiencing NCDs compared to those who work fewer hours.
- **Lack of Sleep Habits:** With an AOR of 1.4 and a statistically significant p-value of 0.004, the data suggests that a lack of healthy sleep habits is associated with an increased likelihood of NCDs among professional musicians, albeit to a lesser extent compared to other risk factors.
- **Musculoskeletal Morbidity:** The AOR of 1.9 indicates a significant association between musculoskeletal morbidity and NCD prevalence among professional musicians. This underscores the impact of musculoskeletal issues on the overall health of musicians and their susceptibility to NCDs.

- **Stress:** With an AOR of 3.3 and a statistically significant p-value of 0.000, stress emerges as a significant risk factor for NCDs among professional musicians. This highlights the importance of addressing stress management strategies within the musician community to mitigate NCD risk.

Table 5 reinforces the importance of addressing various habits and lifestyle factors among professional musicians to reduce the risk of NCDs. These findings underscore the need for targeted interventions and lifestyle modifications to promote better health outcomes within this population.

## DISCUSSION

The present study's findings on the prevalence of Non-Communicable Diseases (NCDs) and their risk factors among professional musicians in Chennai resonate with broader research themes in musicians' health. The high incidence of lifestyle-related risk factors observed, such as insufficient physical activity, unhealthy dietary patterns, and the use of tobacco and alcohol, underscores a significant health concern mirrored in international studies focusing on musicians' musculoskeletal disorders and general health education.

The study by **Stanhope et al (2019)** [14] which found that 81.6% of professional symphony orchestra musicians in Greece experienced musculoskeletal disorders, highlights the physical demands placed on musicians. Similar to our findings on lifestyle risk factors, it suggests a global trend of occupational health risks within the music profession, with specific vulnerabilities linked to the physical nature of musical performance. The associations identified by Fotiadis et al. with gender, age, type of instrument, and rehearsal duration further parallel our study's demographic associations, emphasizing the multifaceted nature of health risks in musicians.

**Matei et al. (2018)** [15] explored the impact of a mandatory health education course for musicians, revealing improved awareness but not necessarily enhanced health outcomes. This aligns with our study's implication that awareness alone may not suffice to mitigate NCD risk factors among musicians. Instead, comprehensive health education that leads to tangible changes in health behaviors is required. The emphasis on hearing protection in Matei et al.'s study also suggests the need for holistic health programs that address both musculoskeletal and non-musculoskeletal health concerns, including those identified in our study, such as diet and exercise.

The research by **Aviva L. Wolff et al. (2021)** [16] on the Musculoskeletal Health for Musicians (MHM) program, which reported decreased pain and pain interference in participants, presents a promising approach to occupational health in music. The success of such targeted interventions supports our study's call for tailored health education and preventive strategies specifically designed for musicians' unique needs.

In comparison, the present study extends the discourse by focusing on a wide range of NCD risk factors, suggesting that musicians' health concerns are not limited to musculoskeletal disorders. The need for comprehensive health interventions that address both the physical demands of musical performance and lifestyle-related health risks is evident. The effectiveness of programs like MHM in mitigating specific health issues points towards the potential benefits of implementing similar multifaceted health promotion strategies within the Indian music community. Such programs should aim not only to improve knowledge and awareness but also to facilitate healthy lifestyle changes, thereby reducing the burden of NCDs among professional musicians.

## CONCLUSION

This study conclusively highlights the heightened risk of non-communicable diseases (NCDs) among professional musicians, emphasized by substantial lifestyle and metabolic risk factors. The notable prevalence of hypertension, diabetes mellitus, and dyslipidemia, along with significant instances of tobacco use, alcohol consumption, physical inactivity, and inadequate dietary practices, underscores the need for prompt and specific health interventions. The research underscores the paramount importance of lifestyle changes, health education, and consistent monitoring as essential strategies to reduce NCD risks among musicians. Considering the relatively young average age of the participants, these measures are critically needed to tackle the health issues prevalent among professional musicians, thereby ensuring their long-term health and career sustainability.

### Author Contribution

Jegadeesan Palani designed the entire work and did the data collection, maintains record, observation, tabulation. Jegadeesan Palani, Krishna Prasanth, Rashmi Gour contributed to overall monitoring, periodic review of reports and making necessary corrections. All the authors checked the final draft.

### References

- 1) Upadhyay RK. Chronic Non-communicable Diseases: Risk Factors, Disease Burden, Mortalities and Control. *Acta Scientific MEDICAL SCIENCES* (ISSN: 2582-0931). 2022 Apr; 6(4).
- 2) Haque M, Islam T, Rahman NA, McKimm J, Abdullah A, Dhingra S. Strengthening primary health-care services to help prevent and control long-term (chronic) non-communicable diseases in low- and middle-income countries. *Risk management and healthcare policy*. 2020 May 18:409-26.
- 3) Kamkuemah M. The epidemiology of Chronic Non-Communicable Diseases (NCDS) and NCD risk factors in adolescents & youth living with HIV in Cape Town, South Africa.
- 4) Thakur JS, Nangia R, Singh S. Progress and challenges in achieving noncommunicable diseases targets for the sustainable development goals. *FASEB BioAdvances*. 2021 Aug; 3(8):563.
- 5) Noncommunicable disease and their risk factors. Available at: <https://www.who.int/ncds/en/>. Accessed on 31 May 2019.
- 6) Mohebbi B, Sabouri M, Tol A. Application of health education and promotion theory-based interventions on patients with cardiovascular disease: A systematic review. *J Educ Health Promot*. 2021; 10:236.
- 7) Gilmour S, Le PM, Nguyen HL, Dao TM, Tran BQ, Van Hoang M, Van Nguyen H. Trends in, projections of, and inequalities in non-communicable disease management indicators in Vietnam 2010–2030 and progress toward universal health coverage: a Bayesian analysis at national and sub-national levels. *EClinicalMedicine*. 2022 Sep 1; 51.
- 8) Banatvala N, Bovet P. *Noncommunicable Diseases: A Compendium*. Taylor & Francis; 2023.
- 9) Kassa M, Grace J. The global burden and perspectives on non-communicable diseases (NCDs) and the prevention, data availability and systems approach of NCDs in low-resource countries. *InPublic Health in Developing Countries-Challenges and Opportunities* 2019 Nov 8. IntechOpen.
- 10) Kontis V, Cobb LK, Mathers CD, Frieden TR, Ezzati M, Danaei G. Three public health interventions could save 94 million lives in 25 years: global impact assessment analysis. *Circulation*. 2019 Aug 27; 140(9):715-25.
- 11) Kulkarni V, Kulkarni V, Gaiha R. Persistence of non-communicable diseases, affluence and inequality in India. *University of Pennsylvania Population Center Working Paper (PSC/PARC)*. 2019; 30.



- 12) Maghiar MJ, Lawrence BJ, Mulders WH, Moyle TC, Livings I, Jayakody DM. Hearing loss and mental health issues in amateur and professional musicians. *Psychology of Music*. 2023 Nov; 51(6):1584-97.
- 13) Stanhope J, Toohar R, Pisaniello D, Weinstein P. Have musicians' musculoskeletal symptoms been thoroughly addressed? A systematic mapping review. *International journal of occupational medicine and environmental health*. 2019 Jun 10; 32(3):291-331.
- 14) Fotiadis DG, Fotiadou EG, Kokaridas DG, Mylonas AC. Prevalence of musculoskeletal disorders in professional symphony orchestra musicians in Greece: a pilot study concerning age, gender, and instrument-specific results. *Medical problems of performing artists*. 2013 Jun 1; 28(2):91-5.
- 15) Mattei J, Tamez M, Ríos-Bedoya CF, Xiao RS, Tucker KL, Rodríguez-Orengo JF. Health conditions and lifestyle risk factors of adults living in Puerto Rico: a cross-sectional study. *BMC public health*. 2018 Dec; 18:1-2.
- 16) Wolff AL, Ling DI, Casey EK, Toresdahl BG, Gellhorn AC. Feasibility and impact of a musculoskeletal health for musicians (MHM) program for musician students: A randomized controlled pilot study. *Journal of Hand Therapy*. 2021 Apr 1; 34(2):159-65.