

Effectiveness of “Healthy Living Training Program” on Obese Policemen

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Abstract

Background: Considering the concerns of obesity problems, Mumbai Police authorities had launched full-day residential “Healthy Living Training Program” in February 2019 for obese policemen. We studied the effectiveness of the program by assessing health profile of the participants, and change in anthropometric measurements and blood pressure readings. **Methods and Materials:** Permission from the concerned authorities and approval from the Institutional Ethics Committee (IEC) were taken. Health profiles of 143 policemen were assessed. Anthropometric measurements and blood pressure recordings were done on the first and the last day of the 28-day program. The data were coded and entered in password-protected Microsoft Excel. Paired *t*-test was applied to test statistically significant differences. The association of some of the variables with weight change was assessed by the Chi-square test for categorical variables. **Results:** The mean age of participants was 49.6 ± 5 years. The proportion of hypertensive, diabetics, vision problems, and bone and joint problems were 48.2%, 23.2%, 57.1%, and 46.4%, respectively. Only 70% of them had home-cooked food in the lunch. Daily, 50% of the participants do physical activity. There was statistically significant weight reduction (105.6 ± 12.1 vs. 103.3 ± 12 kg), body mass index (BMI) (36.3 ± 3.4 vs. 35.5 ± 3.3), waist circumference (110.8 ± 7.9 vs. 109.5 ± 7.9), and hip circumference (115.6 ± 8.1 vs. 106.8 ± 15.0) of the participants after 28 days of training program. **Conclusion:** “Healthy Living Training Program” was effective in reducing weight, blood pressure, BMI, and waist and hip circumference. The program benefitted the participants by inculcating healthy lifestyles and raising awareness of health issues.

Keywords: Effectiveness, lifestyle, morbidity, physical activity, police, weight

INTRODUCTION

Obesity is one of the most common yet among the most neglected public health problems according to the World Health Organization (WHO).^[1] World Health Statistics Report, 2012, states that globally one in six adults is obese, and nearly 2.8 million individuals die each year due to being overweight or obese.^[2] In India, a study based on NFHS-5 data estimated that 13.85% of adult individuals are obese.^[3]

Although policemen are considered more physically active than the general population, studies indicate that police officers are more prone to being obese or having diseases related to obesity over a period of time.^[4] Tharkar *et al.* demonstrated a higher prevalence of obesity among police officers compared to nonpolice workers.^[5] Another study by Kumar *et al.*^[6] showed a higher prevalence of diabetes among the police personnel in the Bankura district in West Bengal. Behavioral variables associated with obesity risk for police officers include physical inactivity, low consumption of fruits and vegetables, frequent

consumption of high-calorie snack foods, and consumption of alcohol. Nonbehavioral factors include long work hours, exposure to police stressors, and perceived police support.^[7] Long and irregular working hours are related to increased health risks among policemen.^[8] Alghamdi *et al.* recommended using preventive programs to combat obesity and being overweight in police officers.^[9] Health promotion interventions can be beneficial to the health of the police force.^[10] Organized health programs are beneficial for bringing about behavioral change and empowering people to make healthy choices even among police officers.^[11-16]

Obesity among police officers has been a major concern for police administrators. An obese police officer may find it

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difficult to engage in physically demanding activities that are expected to occur in a law enforcement officer’s daily duties.^[17] Considering the concerns over obesity among the police, 2019, the Mumbai Police launched the most ambitious program called “Healthy Living Training Program,” also called “Swasth Police – Sashakt Police,” that is, “Healthy police – Fit police” in the local language. Participants were given a month off from work to attend the program.^[18] This first batch was conducted from February 01, 2019, to February 28, 2019, for male police personnel who voluntarily enrolled. The police department took the initiative of training obese policemen to reduce their body weight and inculcate healthy habits. It was a full-day and one-month (28 days) residential training program.

We planned to scientifically assess the effectiveness of this program.

Objective

To study the health profile of the participants and assess the changes in weight, blood pressure, and waist and hip circumference at the beginning and end of the program.

MATERIALS AND METHODS

Study setting, participants, and sampling:

The study is a pre- and postevaluation of a health program that included all police personnel with body mass index (BMI) ≥ 30 . A total of 150 participants enrolled, among which 7 participants had to be excluded due to high blood pressure and severe breathlessness, as there was physical activity to be done as part of the program. Thus, a total of 143 participants were included. As this study was a health initiative program, a universal sampling technique was used, and therefore, all participants as per the inclusion criteria were enrolled.

Intervention (Healthy Living Training Program) and data collection: Figure 1 represents a trial profile diagram summarizing major milestones and activities.

It was a residential full-day training program conducted from 7 am to 7 pm daily, except on Sunday, for 28 days. A health checkup was done on the 1st and 28th days of the program. Each day included the following activities:

- 1) Awareness sessions: Each day included sessions on different topics such as obesity, hypertension, diabetes mellitus, heart diseases, respiratory diseases, ear problems, eye problems, orthopedic problems.
- 2) Provision of a healthy diet: The canteen was instructed to provide only healthy meals and snacks. Leading nutritionists conducted the session for the participants and also guided the menu for the participants. One session was organized for the wives and parents of the participants to raise awareness of a balanced diet and healthy cooking.
- 3) Daily physical training: Daily 1 hour each of physical training and yoga sessions were conducted by an in-house physical trainer and a yoga expert, respectively.
- 4) Sports activity: In the evening, participants were

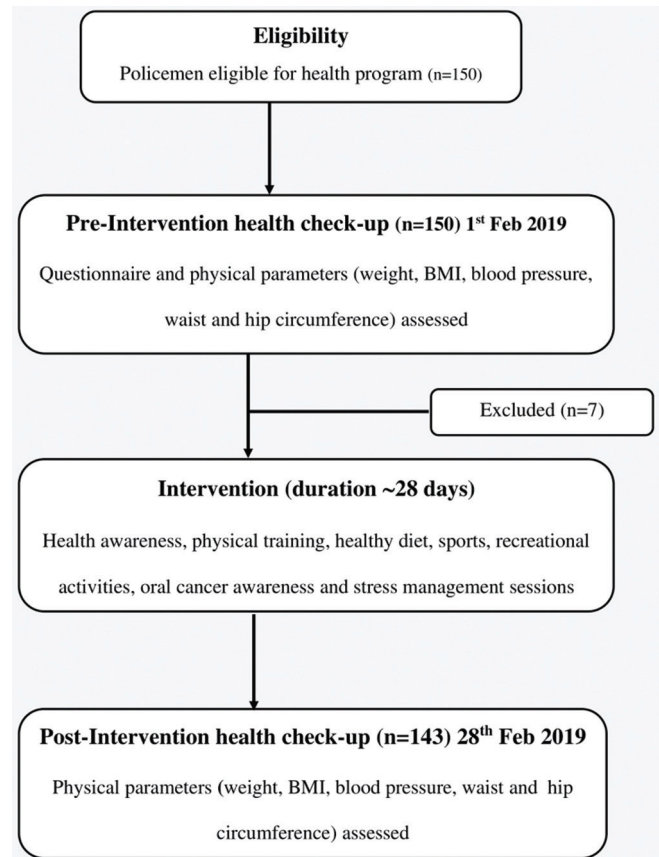


Figure 1: Trial profile diagram summarizing the major milestones and activities

motivated to play any outdoor sports of their choice, such as volleyball, football, cricket.

- 5) Stress management sessions: Sessions were conducted by professionals for 1 day with the focus on ways to relieve stress.
- 6) Tobacco addictions: A session was conducted by a preventive oncologist to discuss the effects of tobacco, and also screened participants for oral cancer or other oral lesions.
- 7) Recreational activities: A family picnic was organized for the participants to watch a movie in a multiplex on Sunday.

This training program aimed to make police aware of healthy living and to reduce their body weight. Our department had coordinated with the police department to perform the pre- and posthealth checkup programs and conduct awareness sessions.

As part of evaluating this unique initiative, after consultation with senior police officers, we designed a questionnaire to interview the participants regarding their morbidity profile, dietary habits such as frequency of outside food eating, and physical activity regarding its type, frequency, and duration. The questionnaire was validated by subject experts, senior police officers, and dieticians. Based on their inputs, we asked about eating homemade or outside food for the last week because then we could capture both weekday’s and weekend’s eating habits. We also recorded their

weight, blood pressure, and waist and hip circumferences on the 1st and 28th days. Permission for study from the concerned police authorities and approval from the Institutional Ethics Committee were taken (EC/OA-97/2019 dated 19/12/2019).

Sample size and analysis

As universal sampling was followed, no sample size was calculated. To maintain confidentiality, data were coded and entered in Microsoft Excel, which was password protected. The normality of the data was assessed using Shapiro–Wilk test. Based on the normality test, a paired *t*-test was applied to test statistically significant differences. The *P* value < 0.05 was considered a statistically significant difference. The association of some of the variables with change in the weight is assessed by the Chi-square test for categorical variables.

RESULTS

The mean age of participants was 49.6 ± 5 years. The general and occupational profile of the participants is shown in Table 1. Almost 93% of the participants were in the age group of 41–59 years. Most of them were head constables (44.6%). Almost 75% of them worked for more than 8 hours per day. Table 2 represents the frequency of eating home-cooked or outside food for various meals. Only 55.2% had home-cooked food for breakfast in the last week. Almost 70% of them had home-cooked food at lunch, and 3.6% had skipped lunch meals. Almost all (96%) of them had dinner at home. Almost all (96%) of the participants had dinner at home, and 41% of them did not eat anything at midmorning or evening snack time. Daily, 50% of the participants did some form of physical activity, such as swimming, cycling, walking, or yoga. Total 75.8% of them performed physical activity ≥ 30 minutes

Table 1: General and Occupational Profile of the participants (*n*=143)

Variable	Frequency (<i>n</i>)	Percentage
Age (in years)		
33–40	11	7.8
41–50	66	46.1
51–59	66	46.1
Marital status		
Married	141	98.6
Widow	2	1.4
Number of family members		
≤ 5	130	90.9
> 5	13	9.1
Current designation		
Assistant Sub-inspector	18	12.6
Hawaladar	16	11.2
Head Constable	64	44.7
Police Nayak	45	31.5
Duty hours (per day)		
8 h	35	24.5
9–12 h	102	71.3
> 12 h	6	4.2

per day. The morbidity profile of the participants is shown in Table 3.

Table 4 shows differences in physical parameters pre- and post-training program. A total of 131 out of 143 (91.6%) showed weight reduction. The mean weight on day 1 and day 28 was 105.6 ± 12.1 kg and 103.3 ± 12 kg, respectively. The reduction of weight of the participants was statistically significant. The minimum and maximum reduction of weight was 0.2 kg and 7.3 kg, respectively. There was no significant association of reduction in weight with age, designation, or comorbidities.

There was a statistically significant reduction in systolic blood pressure from day 1 to day 28 (141.1 ± 19 mm Hg vs. 138.1 ± 19 mm Hg). The difference in diastolic blood pressure was also statistically significant (85.9 ± 12.4 mm Hg vs. 83.2 ± 10.6 mm Hg).

There was a statistically significant difference in the reduction of BMI (36.3 ± 3.4 vs. 35.5 ± 3.3), waist circumference (110.8 ± 7.9 vs. 109.5 ± 7.9), and hip circumference (115.6 ± 8.1 vs. 106.8 ± 15.0) [Figures 1 and 2].

DISCUSSION

The hierarchy of police force from junior level to senior level is Police Constable, Police Nayak, Head Constable, Assistant Sub-inspector, Police Sub-inspector, Assistant Police Inspector, Police Inspector, Senior Police Inspector, Assistant Commissioner of Police, and Deputy Commissioner of Police.^[19]

In the present training program, most of them were from the junior-level cadre, since it was more focused on this group of police personnel, but others were also invited to participate.

The mean age of participants was 49.6 ± 5 years. The training program was meant for obese policemen. This shows that younger age police personnel were not overweight. As the age increased, may be the proportion of policemen with obesity increased, leading to higher enrollment of middle age groups in this training program. Socioeconomic factors associated with greater obesity include female gender, middle age, urban residence, and higher educational and economic status.^[20] We also got a similar finding of obesity in middle age group among police personnel.

Police officers begin their career slimmer and fitter than the population. Within 10–15 years of service, 30%–40% of police officers become obese and less fit than the general population.^[21] We observed the same trend. The age group enrolled for the training program was from 31 to 59 years. Thus, it is necessary to intervene at an early period, if we need to prevent obesity issue in the police force.

Almale *et al.*^[22] found a higher percentage of police working more than 16 hours a day. In the present group, only 4% work for more than 12 hours/day. This varied finding may be due to the administrative measures that must have been taken over a while regarding duty hours of police. In this batch of training, all were married except one. In their study, 91% were married. This is due to the variation in the age group. All the participants

Table 2: Frequency of Eating Home or Outside Food by the Participants in the Last One Week (n=143)

	Breakfast (n) (%)	Mid-morning Snacks (n) (%)	Lunch (n) (%)	Evening Snacks (n) (%)	Dinner (n) (%)
Both (sometimes home cooked or outside food)	57 (39.9%)	23 (16.1%)	27 (18.8%)	26 (18.2%)	15 (10.5%)
Only home cooked	79 (55.2%)	45 (31.5%)	100 (69.9%)	26 (18.2%)	122 (85.3%)
Only outside food	7 (4.9%)	17 (11.8%)	11 (7.7%)	33 (23.1%)	2 (1.4%)
Not eating anything	0	58 (40.6%)	5 (3.6%)	58 (40.5%)	4 (2.8%)

Figures in parentheses represent column-wise percentages

Table 3: Morbidity Profile of the Participants (n=143)

Variable	Frequency (n)	Percentage
Hypertension	69	48.2
Diabetes mellitus	33	23.2
Both hypertension and diabetes mellitus	27	18.8
Asthma	5	3.5
Other respiratory diseases	10	6.9
Bone or joint problems	66	46.1
Hearing problems	23	16.1
Vision problems	82	57.3
Abnormal ECG findings	38	26.6
Left bundle branch block (5)		
Right bundle branch block (6)		
Right ventricular hypertrophy (5)		
Left axis deviation (7)		
Sinus bradycardia (6)		
Abnormal P wave (3)		
More than above 1 finding (6)		

Table 4: Difference in Parameters Pre- and Post-training Program

Variables	Pre-training Mean±SD	Post-training Mean±SD	P*
Weight	105.7±12.1	103.3±12	<0.001
BMI	36.32±3.36	35.5±3.34	<0.001
Systolic BP	141.06±18.89	138.06±19.23	0.045
Diastolic BP	85.94±12.41	83.21±10.60	0.025
Waist circumference	110.8±7.98	109.5±7.98	0.005
Hip circumference	115.60±8.04	106.88±15.03	0.001

*Paired t-test

were above 30 years of age. As per the Indian societal norms, almost all get married by this age.

It was observed that almost half of the participants skipped to eat home-cooked breakfast. Almost all the participants were married (except one participant). In a typical Indian family, usually homemaker (wife) usually cooks all the meals (breakfast, lunch, and dinner) for her family members. However, many of the participants could not eat breakfast. This may be due to their duty shift timings. Almost 70% of the participants ate homemade food for lunch. This must be due to the usual practice of carrying a lunch box at the workplace. Similarly, almost 80% ate dinner at home. This observation of eating outside food either in the morning, afternoon, or evening time by the participants is a worrying issue.

There is a tendency to gain weight when the frequency of eating outside food, which is usually energy-dense food, increases. This may be one of the reasons for the current high BMI. Studies indicate that the timing of food intake can significantly affect metabolism and weight management. Workers operating at atypical times of the 24 hours a day are at risk of disturbed feeding patterns.^[23] One of the clearest dietary impacts of shift work is the overall displacement of the fasting/feeding cycle and its effect on meal timings across the day. Moonmoon *et al.* in their research concluded that eating within the premises of police department should be guided by nutrition principles to ensure the provision of convenient, nutritious, varied, acceptable, and affordable meals for police to discourage reliance on unhealthy convenient fast foods that expose police to future health risks that are preventable.^[24] This was implemented in this training program. For one month, the canteen provided nutritious and locally acceptable food to the participants. The training program was supervised by one of the leading nutritionists.

In a study conducted by S Hakan Can *et al.*, cardiovascular and strength training physical activities were the behavioral variables that differed significantly between nonobese and obese police officers.^[7] In the present participant group, only 50% were engaged in physical activity, that too only of moderate intensity such as cycling or running. Thus, one of the objectives of the training program was to inculcate a habit of physical activity amongst the participants. They were allowed to play outdoor sports of their choice. Mass physical training and yoga were regularly conducted. It was observed that the participants felt the importance of regular physical activity through this training program. The police department had collaborated with professionals for yoga sessions. Physical exercises were conducted by in-house trainers.

The most common morbidities were hypertension, diabetes, bone and joint problems, and vision problems. This was in concurrence with the study by Meena *et al.*^[25] Almost 50% and 23% of the participants were hypertensive and diabetic, respectively. Hypertension and diabetes mellitus were seen in older age group participants. In a study conducted by Anchala *et al.*,^[26] the overall prevalence of hypertension in India was 29.8% (95% confidence interval: 26.7–33.0). The prevalence of diabetes in adults aged 20 years or older in India was 7.7% (6.9–8.4) in 2016.^[27] However, we got much higher proportions of hypertensives and diabetics among participants, as they were all obese, and it is the risk factor for other noncommunicable

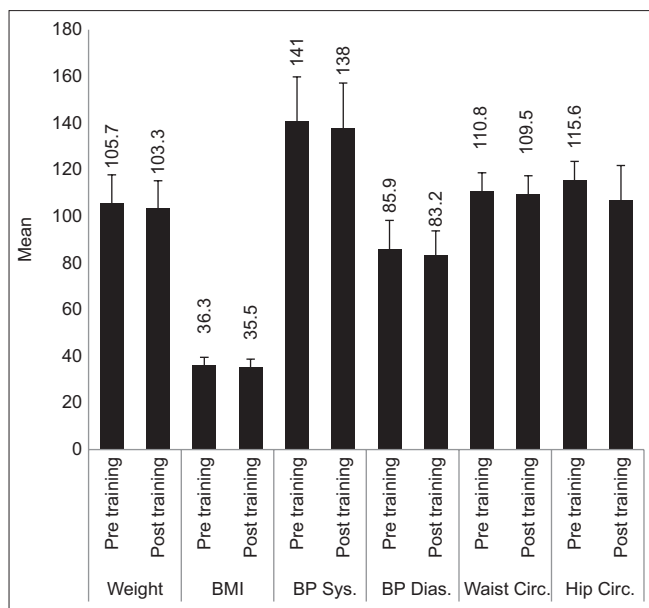


Figure 2: Difference in parameters pre- and post-training program

diseases as well. It was also observed that almost 50% of them skipped at least taking one tablet of antihypertensive or antidiabetes medication in the last week. This may be due to their long working hours or sometimes unexpected workload. This can have a detrimental effect on their health.

As a part of the preassessment before training, electroencephalogram (ECG) was recorded of each participant. Almost 26% had some abnormal findings. This shows the importance of periodic medical examinations for early detection of heart ailments and treatment.

The prevalence and incidence of hearing impairment in India are substantially high. The prevalence of deafness in Southeast Asia ranges from 4.6% to 8.8%.^[28] Amongst the participants, 16% had hearing problems, most common being hearing loss. This proportion is much higher than the national figure. The reason may be that some of the participants were traffic police. The prevalence of hearing loss is usually high in traffic policemen due to constant exposure to traffic sounds.

Occupation such as policing would demand that police officers stay fit as a part of the job requirements. Police officers are engaged in physical challenges regularly. Chism^[29] in his dissertation has cited several articles on the initiative undertaken for police officers. In India, police departments in various states have also taken initiatives for obese policemen to maintain their fitness.^[30-32]

The present training program conducted for obese policemen could significantly reduce the weight, blood pressure, BMI, and hip and waist circumference of the participants. There was a mean difference of 2.4 kg in weight loss. In any program, weight loss should be gradual, about 0.450–0.907 kg per week.^[33] In our program, it was an average of 0.6 kg per week weight loss, which

is clinically significant. Thus, this 1-month residential program to train obese policemen for healthy living was found to be effective. It was observed that policemen also felt a sense of responsibility to keep them healthy. In this training program, apart from diet, physical exercises, and awareness sessions, leisure activities such as playing sports of their choice and movie watching with the family were also organized. These measures boosted confidence in police personnel. Singh *et al.*^[10] also suggested that the police department should plan social get-togethers and other leisure activities to enhance well-being and positivity.

Regarding the intervention fidelity, the training program was conducted as planned. To ensure that participants could do daily physical activity in the early morning, residential facilities were provided for the individuals who stayed far from the venue. Thus, most preferred to stay, being a residential training program. Also, the seniors supervised the daily canteen menu and ensured that healthy meals were provided. Even those who preferred to go back home had their dinner meal at 7 pm at the venue and went back home.

The major issue with such a training program is sustainability and administrative measures to organize and coordinate in order to engage almost 100 policemen for 1 month. Strong administrative will is required to manage and sustain such type of programs, considering the work pattern of the police personnel. This program is an excellent example of worksite intervention to inculcate healthy lifestyles in their employees. Such a program needs adequate manpower and infrastructure, such as training hall, eating facilities, and a playground for outdoor facilities. Under Ayushman Bharat, there are wellness center facilities that also promote healthy lifestyles through yoga sessions and raising awareness on important health issues. Public health departments can collaborate with such organized sectors to provide these services. In this program, our community medicine department collaborated with the police department. Various other medical colleges in our country can collaborate with the police department or other organized sectors to provide their technical expertise so that such worksite intervention programs are successful and benefit a large number of the population. Moreover, people have started learning via online mode after COVID pandemic. Thus, awareness sessions on health issues, nutrition, physical activity, etc., can be conducted via online sessions. This may cut short the number of contact session days.

This evaluation research was an effort to scientifically assess the effectiveness of the training program conducted by the police department. It showed a significant reduction in anthropometric measurements and blood pressure. This can be attributed to the training program, since it was done under a controlled setting wherein the participants' diet and physical activity were supervised, which plays an important role in weight reduction.

The limitation of this research is that we could not follow up with the participants to assess their weight and other parameters after a few months. We could not assess whether the trained participants have continued healthy practices, such as healthy

diet and physical activity. Further interventional research can be undertaken with follow-up of study participants.

CONCLUSION

“Healthy living training Program” conducted for obese policemen was effective in reducing weight, blood pressure, BMI, and waist and hip circumference. The program benefitted the participants by inculcating healthy lifestyles, such as eating healthy food and daily physical activity, which were the major reasons for lowering their anthropometric measurements. It generated awareness among them on common health problems.

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Conflicts of interest

There are no conflicts of interest.

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