RESEARCH ARTICLE

“AN EXPLORATORY STUDY TO IDENTIFY THE INFLUENCING FACTORS OF CARDIO-RESPIRATORY FITNESS AMONG NURSING STUDENTS AT KGMU, LUCKNOW U.P”

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Abstract

Introduction: The cardio respiratory fitness is having an greater role in the reduction of morbidity mortality related to the cardiac disease. In India cardiac diseases are the major cause factor for the mortality. Around 80% of death is happening in India due to cardio respiratory diseases. In 18th centuries cardiovascular disease risk age groups lies in the age above 40 years but in the current situation it’s being reduced to the 25-30 years due to lifestyle changes and dietary alternations. This statistics reveals the importance of early detection of risk contributing factors and the modification of such risk factors. Which can effectively beneficial for the upcoming adults.

Need and Significance of the Study: Researcher have noticed high incidence of mortality due to cardiovascular disorder among young adults. The causative factor behind this is poor cardio-respiratory fitness. Thus researcher felt the need to undertake this study to identify the influencing factors of cardio-respiratory fitness among young nursing students.

Aim of The Study: To identify and explore the influencing factors of cardio-respiratory fitness among young nursing students.

Objectives:

1. To assess influencing factors of cardio-respiratory fitness among nursing students.
2. To determine association and correlation of cardio-respiratory determinants (VO2 max, HRR & Tolerated time in TMT) with selected demographic variables.
3. To determine association and correlation of cardio-respiratory determinants (VO2 max , HRR & Tolerated time in TMT) with selected clinical profile.
4. To determine association and correlation of cardio-respiratory determinants (VO2 max, HRR & Tolerated time in TMT) with selected diagnostic tests findings.

Methodology: Quantitative research approach was used in this study and exploratory research design was adopted for this study. 100 bsc Nursing students from KGMU College was selected for this study and correlation

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between cardio reperatory determinants and demographic variables was analysed using inferential and non inferential statistical methods.

**Results:** The study results projects that a clear association and correlation of cardio-respiratory determinants (VO2 max, HRR & Tolerated time in TMT) with selected demographic variables. In the aspect of demographic variables: Family income is showing a significant association with VO2Max and it’s showing moderate positive correlation with VO2 Max. The study also giving the evidences of significant association and correlation of cardio-respiratory determinants (VO2 max HRR and Tolerated time in TMT) with selected diagnostic test findings such as LDL is showing negative correlation & selected clinical profile such as skinfold test is showing a moderate positive correlation with VO2 Max. HDL in the prime parameter of diagnostic findings which is showing a positive correlation with HRR. In The aspect of tolerated time in TMT is showing an association and moderate positive correlation with 2D Echo. These results were statistically proving H1, H2, H3.That means there is a significant association and correlation of cardio-respiratory determinants (VO2 max ,HRR & tolerated time in TMT ) with selected demographic variables. There is a significant association and correlation of cardio-respiratory determinants (VO2 max ,HRR and Tolerated time in TMT) with selected physical examination findings and There is a significant association and correlation of cardio-respiratory determinants (VO2 max ,HRR & Tolerated time in TMT) with selected diagnostic tests findings.

**Conclusion:** The study results projects that a clear association and correlation of cardio-respiratory determinants (VO2 max, HRR & Tolerated time in TMT) with selected demographic variables and other parameters such as clinical profiles and diagnostic tests.

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**Introduction:**

The cardio respiratory fitness is having an greater role in the reduction of morbidity mortality related to the cardiac disease. In India cardiac diseases are the major cause factor for the mortality. Around 80% of death is happening in India due to cardio respiratory diseases. In 18th centuries cardiovascular disease risk age groups lies in the age above 40 years but in the current situation it’s being reduced to the 25-30 years due to lifestyle changes and dietary alternations. This statistics reveals the importance of early detection of risk contributing factors and the modification of such risk factors. Which can effectively beneficial for the upcoming adults.

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Hopkinson’s medicine given a data that approximately 84 million people in this country suffer from some form of cardiovascular disease, causing about 2,200 deaths a day, averaging one death every 40 seconds.

M N Krishnan shared an article and review regarding “Coronary heart disease and risk factors in India – On the brink of an epidemic in 2012 in Indian heart journal He reviewed the prevalence and pattern of increase in cardiac diseases from the year 1993 to 2012 with the help of various literature reviews. After revision he get in to the conclusion that CHD is the key cause factor of mortality and morbidity across the world and its is completely correlated with Hypertension Diabetes mellitus High cholesterol and the lifestyle factors.

Recent data has shown that the cause of large national health burden of chronic diseases is due to behavioral dimensions such as physical inactivity and low levels of cardio-respiratory fitness. The identified modifiable risk factors include smoking, obesity, high blood pressure, high cholesterol levels, diabetes, lack of physical activity, unhealthy diet, and stress.
factors that can affect cardio respiratory fitness included blood pressure and fasting blood levels of glucose, triglycerides, total cholesterol and high-density lipoprotein and cholesterol

Statement Of The Problem:
“An exploratory study to identify the influencing factors of cardio-respiratory fitness among nursing students at KGMU, Lucknow U. P”.

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Hypotheses:
1. \( H_1 \): There will be significant association and correlation of cardio-respiratory determinants (VO2 max, HRR & Tolerated time in TMT) with selected demographic variables.
2. \( H_2 \): There will be significant association and correlation of cardio-respiratory determinants (VO2 max, HRR & Tolerated time in TMT) with selected physical examination findings.
3. \( H_3 \): There will be significant association and correlation of cardio-respiratory determinants (VO2 max, HRR & Tolerated time in TMT) with selected diagnostic tests findings.

Assumptions:
Students would give honest responses to the questions

Theoretical Framework:
Theoretical framework selected of this study is based on the concept of the Health Belief Model by Rosenstock, Stretcher & Becker (1997):
The Health Belief Model (HBM), a motivational model, is most commonly used theory in health education and health promotion.

Review Of Literature:-
Review of literature is mainly classified in to two
1. Literature related to prevalence and associated risk factors of cardiovascular disorder.
2. Literature related to Cardio-respiratory fitness.

World Health Organization (2018):
Cardiorespiratory fitness represents a relation between physical activity behaviors and health outcomes that reflects in the capacity of various organs, such as the heart, lungs and muscles, to produce energy during physical activity and exercise. 30–50% of cardiorespiratory fitness is mainly determined by genetics, routine physical activity will enhance the fitness; which is therefore a proximal outcome of physical activity levels. On the aspect of public health perspective, cardiorespiratory fitness provides a robust measure, because of it will lower the month-to-month variability within each individual individuals. Cardiorespiratory fitness may be a stable indicator of current physical activity levels, which will resemble to glycosylated hemoglobin, reflecting glucose control over a period of several months.

Satish V et.al.(2018):
conducted a randomized controlled trial of Yoga versus physical exercise for cardio-respiratory fitness in adolescent school children 802 school students from 10 schools across four districts were recruited for this study. two arm RCT
around 802 students were randomized to receive daily one hour yoga training (n = 411) or physical exercise (n = 391) over a period of two months. VO2 max was estimated using 20 m shuttle run test. However, yoga (n = 377) and physical exercise (n = 371) students contributed data to the analyses. Data was analysed using students t test. There was a significant improvement in VO2 max using 20 m Shuttle run test in both yoga (p < 0.001) and exercise (p < 0.001) group following intervention. There was no significant change in VO2 max between yoga and physical exercise group following intervention. However, in the subgroup with an above median cut-off of VO2 max; there was a significant improvement in yoga group compared to control group following intervention (p = 0.03). The results suggest yoga can improve cardio-respiratory fitness and aerobic capacity as physical exercise intervention in adolescent school children.

Research Methodology:-

- **Research Approach**: Quantitative Approach
- **Research Design**: Explorative research design
- **Research Setting**: KGMU Lucknow
- **Demographic variables**: Age, Gender, Education, Financial dependency,

Place of stay, Family income, Dietary pattern, Frequency of fast & feast, any drug indulgence and Physical activities.

- **Clinical variable**: Family History Cardiac disorder, Family history of Respiratory disorder, Co Morbid illness, Breathing pattern, H.R, B.P, Auscultation finding, Height, weight, BMI, MUAC, W.C, H

- **Population**: Nursing Students
- **Sample**: BSc. Nursing Students
- **Accessible Population**: In this study, accessible population refers to Nursing Students at KGMU College of Nursing, Lucknow

- **Sample size**: 100 nursing Students
- **Sampling Technique**: Simple Random Sampling
- **Tool**: In this study the structured tool consists of 3 sections:

  - **Section 1**: Demographic data - It consists of 14 demographic variables of Nursing students
  - **Section 2**: Clinical assessment & Diagnostic test findings
  - **Section 3**: Cardio respiratory determinants (VO2Max, HRR, Tolerated time in TMT)

Data Collection Method:
A formal order was obtained from the ethical permission from the ethical committee of KGMU Lucknow. Data collection was done within the given period with the help of pre decided tool and tabulated by the inferential and non-inferential statistics

Major Findings Of The Study:-

**Section -1**: Description of sample characteristics

| Variable         | Category  | Frequency | Percent |
|------------------|-----------|-----------|---------|
| Age              | 18-19     | 16        | 16.0    |
|                  | 20-21     | 40        | 40.0    |
|                  | 22-23     | 21        | 21.0    |
|                  | 24-25     | 23        | 23.0    |
| Gender           | Male      | 33        | 33.0    |
|                  | Female    | 67        | 67.0    |
| Marital Status   | Married   | 0         | 0.0     |
|                  | Unmarried | 100       | 100.0   |
|                  | Other     | 0         | 0.0     |
| Educational status| Illiterate| 0         | 0.0     |
|                  | Primary   | 0         | 0.0     |
|                  | Secondary | 0         | 0.0     |
|                  | Senior Secondary | 0 | 0.0 |
|                  | Graduation| 0         | 0.0     |
|                  | Pursuing graduation | 100 | 100.0 |
| Financial dependency | Self Dependent | 0 | 0.0 |
|----------------------|----------------|----|-----|
|                      | Depend on others | 100 | 100.0 |
| Place of stay        | Rural | 26 | 26.0 |
|                      | Urban | 74 | 74.0 |
| Family income        | Below 5000 | 11 | 11.0 |
|                      | Between 5000 and 10000 | 14 | 14.0 |
|                      | Between 10000 and 20000 | 25 | 25.0 |
|                      | Between 20000 and 25000 | 31 | 31.0 |
|                      | Above 25000 | 19 | 19.0 |
| Diet                 | Vegetarian | 55 | 55.0 |
|                      | Non Vegetarian | 45 | 45.0 |
| Freq. OF Fast Food   | 0-2 | 60 | 60.0 |
|                      | 3 or above | 40 | 40.0 |
| Freq. OF Fast        | 0-2 | 97 | 97.0 |
|                      | 3 or above | 3 | 3.0 |
| Freq. OF Feast       | 0-2 | 92 | 92.0 |
|                      | 3 or above | 8 | 8.0 |
| Drug indulgence      | No | 93 | 93.0 |
|                      | Smoke | 0 | 0.0 |
|                      | Smokeless | 0 | 0.0 |
|                      | Alcohol | 0 | 0.0 |
|                      | Other | 6 | 6.0 |
|                      | Over counter | 1 | 1.0 |
| Physical Exercise    | Not all | 18 | 18.0 |
|                      | Occasionally | 45 | 45.0 |
|                      | Twice a week | 13 | 13.0 |
|                      | 3 times a week | 9 | 9.0 |
|                      | Not Known | 15 | 15.0 |

Table No 1:- Frequency & Percentage distribution of Demographic variables.

Section 1.2:- Clinical categorization of parameters according to various assessment.

| Variables                  | Categories | Frequency | Percentage |
|----------------------------|------------|-----------|------------|
| Heart Rate Recovery time   | Low        | 30        | 30.0       |
|                            | Normal     | 63        | 63.0       |
|                            | High       | 7         | 7.0        |
| VO2 Max                    | Low        | 30        | 30.0       |
|                            | Normal     | 66        | 66.0       |
|                            | High       | 4         | 4.0        |
| TMT                        | Low        | 27        | 27.0       |
|                            | Normal     | 72        | 72.0       |
|                            | High       | 1         | 1.0        |

Table No 2:-Clinical categorization of parameters according to various assessment
1. Majority of samples are lies in the category of Normal Heart rate recovery time (63%)
2. Majority of samples are lies in the category of Normal VO2 Max range (66%)
3. Majority of the samples belongs to the category of normal TMT tolerance level (72%)
### Section -2.1 :- Association& correlation VO₂ Max with selected demographic variables.

| Variable | Category | VO₂ Max | Chi Square (p-value) | Fisher's Exact Significance | Correlation (Kendall’s tau c) |
|----------|----------|---------|----------------------|-----------------------------|-------------------------------|
|          |          | Low     | Normal | High     |                      |                               |                               |
| Age      | 18-19    | 9       | 6      | 1        | 8.603 (0.197)       | 0.150                         | 0.122 (0.153)                 |
|          | 20-21    | 11      | 27     | 2        |                      |                               |                               |
|          | 22-23    | 4       | 17     | 0        |                      |                               |                               |

- **Heart Rate Recovery time**
  - Normal: 66%
  - High: 4%
  - Low: 27%

- **Tolerated Time in TMT**
  - Normal: 72%
  - High: 27%
  - Low: 1%
|                          | 24-25 | 16 | 1 | 26.1% | 69.6% | 4.3%   | 2.094 (0.434) | 0.341 | 0.128 (0.164) |
|--------------------------|-------|----|--|-------|-------|--------|----------------|-------|---------------|
| Gender                   | Male  | 13 | 19| 1     | 13.9% | 57.6% | 3.0%          | 2.094 (0.434) | 0.341 | 0.128 (0.164) |
|                          | Female| 17 | 47| 3     | 25.4% | 70.1% | 4.5%          | 1.783 (0.410) | 0.599 | -0.002 (0.984) |
| Place of stay            | Rural | 7  | 19| 0     | 26.9% | 73.1% | 0.0%          | 1.783 (0.410) | 0.599 | -0.002 (0.984) |
|                          | Urban | 23 | 47| 4     | 31.1% | 63.5% | 5.4%          | 1.783 (0.410) | 0.599 | -0.002 (0.984) |
| Family income            | Below 5000 | 2  | 9 | 0     | 18.2% | 81.8% | 0.0%          | 18.006 (0.019) | 0.016 | 0.232 (0.044) |
|                          | Between 5000 and 10000 | 8  | 4 | 2     | 57.1% | 28.6% | 14.3%         | 2.743 (0.263) | 0.263 | -0.157 (0.095) |
|                          | Between 10000 and 20000 | 9  | 16| 0     | 36.0% | 64.0% | 0.0%          | 2.743 (0.263) | 0.263 | -0.157 (0.095) |
|                          | Between 20000 and 25000 | 8  | 23| 0     | 25.8% | 74.2% | 0.0%          | 2.743 (0.263) | 0.263 | -0.157 (0.095) |
|                          | Above 25000 | 3  | 14| 2     | 15.8% | 73.7% | 10.5%         | 2.743 (0.263) | 0.263 | -0.157 (0.095) |
| Diet                     | Vegetarian | 13 | 39| 3     | 23.6% | 70.9% | 5.5%          | 2.743 (0.263) | 0.263 | -0.157 (0.095) |
|                          | Non Vegetarian | 17 | 27| 1     | 37.8% | 60.0% | 2.2%          | 2.743 (0.263) | 0.263 | -0.157 (0.095) |
| Freq. OF Fast Food       | 0-2    | 20 | 38| 2     | 33.3% | 63.3% | 3.3%          | 0.884 (0.643) | 0.651 | 0.088 (0.340) |
|                          | 3 or above | 10 | 28| 2     | 25.0% | 70.0% | 5.0%          | 0.884 (0.643) | 0.651 | 0.088 (0.340) |
| Freq. OF Fast            | 0-2    | 30 | 63| 4     | 30.9% | 64.9% | 4.1%          | 1.593 (0.602) | 0.602 | 0.031 (0.088) |
|                          | 3 or above | 0  | 3 | 0     | 0.0%  | 100.0%| 0.0%          | 1.593 (0.602) | 0.602 | 0.031 (0.088) |
| Freq. OF Feast           | 0-2    | 27 | 61| 4     | 29.3% | 66.3% | 4.3%          | 0.527 (>0.999) | 0.788 | -0.032 (0.534) |
|                          | 3 or above | 3  | 5 | 0     | 37.5% | 62.5% | 0.0%          | 0.527 (>0.999) | 0.788 | -0.032 (0.534) |
| Drug indulgence          | No     | 29 | 60| 4     | 31.2% | 64.5% | 4.3%          | 1.479 (0.827) | 0.827 | 0.026 (0.353) |
|                          | Other  | 1  | 5 | 0     | 16.7% | 83.3% | 0.0%          | 1.479 (0.827) | 0.827 | 0.026 (0.353) |
|                          | Over counter | 0 | 1 | 0     | 0.0%  | 100.0%| 0.0%          | 1.479 (0.827) | 0.827 | 0.026 (0.353) |
| Physical Exercise        | Not all | 8  | 10| 0     | 44.4% | 55.6% | 0.0%          | 0.0%  | 0.0%          |
|                          | Occasionally | 12 | 31| 2     | 26.7% | 68.9% | 4.4%          | 0.0%  | 0.0%          |
|                          | Once a week | 5  | 7 | 1     | 38.5% | 53.8% | 7.7%          | 0.0%  | 0.0%          |
|                          | Twice a week | 3  | 5 | 1     | 33.3% | 55.6% | 11.1%         | 0.0%  | 0.0%          |
|                          | 3 times week | 2  | 13| 0     | 13.3% | 86.7% | 0.0%          | 0.0%  | 0.0%          |

**Table No:2.1:** Association & correlation $VO_2$ Max with selected demographic variables
**Inference:**
1. As the p-value for Chi-square and Fisher’s exact test for Family income is less than 0.05 it is obtained that VO2 Max is associated with the Family income.
2. The value of correlation is 0.232, which shows that the VO2 Max is moderately positively correlated with Family income.
3. All the other p-values are more than 0.05 therefore no other demographic variable is significantly related with VO2 max.

**Section -2.2:- Association & correlation of HRR with selected demographic variables.**

| Variable          | Category  | Heart Rate Recovery time | Chi Square (p-value) | Fisher's Exact Significance | Correlation (Kendall's tau c) |
|-------------------|-----------|--------------------------|----------------------|----------------------------|-------------------------------|
|                   | Low      | Normal | High |                   |                               |                               |
| Age               | 18-19    |         |       |                   |                               |                               |
|                   | 6        | 9      | 1     | 1.199             | (0.979)                       | 0.978                         | 0.045 (0.517) |
|                   | 37.5 %   | 56.3%  | 6.3%  |                   |                               |                               |               |
|                   | 20-21    |         |       |                   |                               |                               |               |
|                   | 12       | 25     | 3     |                   |                               |                               |               |
|                   | 30.0 %   | 62.5%  | 7.5%  |                   |                               |                               |               |
|                   | 22-23    |         |       |                   |                               |                               |               |
|                   | 5        | 14     | 2     |                   |                               |                               |               |
|                   | 23.8 %   | 66.7%  | 9.5%  |                   |                               |                               |               |
|                   | 24-25    |         |       |                   |                               |                               |               |
|                   | 7        | 15     | 1     |                   |                               |                               |               |
|                   | 30.4 %   | 65.2%  | 4.3%  |                   |                               |                               |               |
| Gender            | Male     |         |       |                   |                               |                               |               |
|                   | 14       | 16     | 3     | 4.489             | (0.114)                       | 0.107                         | -0.026 (0.748) |
|                   | 42.4 %   | 48.5%  | 9.1%  |                   |                               |                               |               |
|                   | Female   |         |       |                   |                               |                               |               |
|                   | 16       | 47     | 4     |                   |                               |                               |               |
|                   | 23.9 %   | 70.1%  | 6.0%  |                   |                               |                               |               |
| Place of stay     | Rural    |         |       |                   |                               |                               |               |
|                   | 6        | 19     | 1     | 1.627             | (0.467)                       | 0.537                         | 0.007 (0.930) |
|                   | 23.1 %   | 73.1%  | 3.8%  |                   |                               |                               |               |
|                   | Urban    |         |       |                   |                               |                               |               |
|                   | 24       | 44     | 6     |                   |                               |                               |               |
|                   | 32.4 %   | 59.5%  | 8.1%  |                   |                               |                               |               |
| Family income     | Below    |         |       |                   |                               |                               |               |
|                   | 5000     |         |       |                   |                               |                               |               |
|                   | 6        | 5      | 0     | 6.551             | (0.603)                       | 0.684                         | 0.033 (0.650) |
|                   | 54.5 %   | 45.5%  | 0.0%  |                   |                               |                               |               |
|                   | Between  |         |       |                   |                               |                               |               |
|                   | 5000 and10000 |       |       |                   |                               |                               |               |
|                   | 4        | 9      | 1     |                   |                               |                               |               |
|                   | 28.6 %   | 64.3%  | 7.1%  |                   |                               |                               |               |
|                   | Between  |         |       |                   |                               |                               |               |
|                   | 10000 and20000 |       |       |                   |                               |                               |               |
|                   | 7        | 17     | 1     |                   |                               |                               |               |
|                   | 28.0 %   | 68.0%  | 4.0%  |                   |                               |                               |               |
|                   | Between  |         |       |                   |                               |                               |               |
|                   | 20000 and25000 |       |       |                   |                               |                               |               |
|                   | 8        | 21     | 2     |                   |                               |                               |               |
|                   | 25.8 %   | 67.7%  | 6.5%  |                   |                               |                               |               |
|                   | Above    |         |       |                   |                               |                               |               |
|                   | 25000    |         |       |                   |                               |                               |               |
|                   | 5        | 11     | 3     |                   |                               |                               |               |
|                   | 26.3 %   | 57.9%  | 15.8% |                   |                               |                               |               |
| Diet              | Vegetarian |       |       |                   |                               |                               |               |
|                   | 16       | 36     | 3     | 0.568             | (0.767)                       | 0.767                         | -0.086 (0.333) |
|                   | 29.1 %   | 65.5%  | 5.5%  |                   |                               |                               |               |
| Non Vegetarian | 14 | 27 | 4 |
|----------------|----|----|---|
|                | 31.1% | 60.0% | 8.9% |
| Freq. OF Fast Food | 0-2 | 18 | 37 | 5 |
|                  | 30.0% | 61.7% | 8.3% |
|                  | 3 or above | 12 | 26 | 2 |
|                  | 30.0% | 65.0% | 5.0% |
| Freq. OF Fast | 0-2 | 30 | 60 | 7 |
|                | 30.9% | 61.9% | 7.2% |
|                | 3 or above | 0 | 3 | 0 |
|                | 0.0% | 100.0% | 0.0% |
| Freq. OF Feast | 0-2 | 29 | 56 | 7 |
|                | 31.5% | 60.9% | 7.6% |
|                | 3 or above | 1 | 7 | 0 |
|                | 12.5% | 87.5% | 0.0% |
| Drug indulgence | No | 29 | 57 | 7 |
|                | 31.2% | 61.3% | 7.5% |
|                | Other | 1 | 5 | 0 |
|                | 16.7% | 83.3% | 0.0% |
|                | Over counter | 0 | 1 | 0 |
|                | 0.0% | 100.0% | 0.0% |
| Physical Exercise | Not all | 6 | 10 | 2 |
|                | 33.3% | 55.6% | 11.1% |
|                | Occasionally | 14 | 28 | 3 |
|                | 31.1% | 62.2% | 6.7% |
|                | Once a week | 6 | 6 | 1 |
|                | 46.2% | 46.2% | 7.7% |
|                | Twice a week | 1 | 8 | 0 |
|                | 11.1% | 88.9% | 0.0% |
|                | 3 times week | 3 | 11 | 1 |
|                | 20.0% | 73.3% | 6.7% |

Table No:2.2:- Association & correlation HRR with selected demographic variables

Inference:
1. Age, Gender, Place of stay, family income, frequency of fast, frequency of feast, drug indulgence and physical exercise showing an association with HRR
2. Demographic variable have no correlation with HRR

Section –2.3:- Association & Correlation Of Tolerated Time In TmtWith Selected Demographic Variables.

| Variable | Category | Tolerated Time in | Chi Square (p) | Fisher's Exact | Correlation |
|----------|----------|-------------------|----------------|----------------|-------------|
|          |          |                   |                |                |             |
|                  | Low | Normal | High | TMT value | Significance | n (Kendall's tau c) |
|------------------|-----|--------|------|-----------|--------------|---------------------|
| **Age**          |     |        |      |           |              |                     |
| 18-19            | 5   | 11     | 0    | 6.665     | 0.243        | 0.032 (0.690)       |
|                  | 31.3% | 68.8%  | 0.0%  |           |              |                     |
| 20-21            | 10  | 29     | 1     |           |              |                     |
|                  | 25.0% | 72.5%  | 2.5%  |           |              |                     |
| 22-23            | 9   | 12     | 0     |           |              |                     |
|                  | 42.9% | 57.1%  | 0.0%  |           |              |                     |
| 24-25            | 3   | 20     | 0     |           |              |                     |
|                  | 13.0% | 87.0%  | 0.0%  |           |              |                     |
| **Gender**       |     |        |      |           |              |                     |
| Male             | 8   | 25     | 0    | 0.728     | 0.874        | 0.133 (0.178)       |
|                  | 24.2% | 75.8%  | 0.0%  |           |              |                     |
| Female           | 19  | 47     | 1     |           |              |                     |
|                  | 28.4% | 70.1%  | 1.5%  |           |              |                     |
| **Place of stay**|     |        |      |           |              |                     |
| Rural            | 7   | 19     | 0    | 0.357     | >0.999       | –0.044 (0.581)      |
|                  | 26.9% | 73.1%  | 0.0%  |           |              |                     |
| Urban            | 20  | 53     | 1     |           |              |                     |
|                  | 27.0% | 71.6%  | 1.4%  |           |              |                     |
| **Family income**|     |        |      |           |              |                     |
| Below 5000       | 3   | 8      | 0    | 6.365     | 0.573        | 0.134 (0.123)       |
|                  | 27.3% | 72.7%  | 0.0%  |           |              |                     |
| Between 5000 and 10000 | 5   | 9      | 0    |           |              |                     |
|                  | 35.7% | 64.3%  | 0.0%  |           |              |                     |
| Between 10000 and 20000 | 5   | 19     | 1    |           |              |                     |
|                  | 20.0% | 76.0%  | 4.0%  |           |              |                     |
| Between 20000 and 25000 | 11  | 20     | 0    |           |              |                     |
|                  | 35.5% | 64.5%  | 0.0%  |           |              |                     |
| Above 25000      | 3   | 16     | 0    |           |              |                     |
|                  | 15.8% | 84.2%  | 0.0%  |           |              |                     |
| **Diet**         |     |        |      |           |              |                     |
| Vegetarian       | 13  | 41     | 1    | 1.440     | 0.571        | 0.005 (0.958)       |
|                  | 23.6% | 74.5%  | 1.8%  |           |              |                     |
| Non Vegetarian   | 14  | 31     | 0    |           |              |                     |
|                  | 31.1% | 68.9%  | 0.0%  |           |              |                     |
| **Freq. OF Fast Food** |     |        |      |           |              |                     |
| 0-2              | 17  | 42     | 1    | 0.849     | 0.891        | –0.022 (0.814)      |
|                  | 28.3% | 70.0%  | 1.7%  |           |              |                     |
| 3 or above       | 10  | 30     | 0    |           |              |                     |
|                  | 25.0% | 75.0%  | 0.0%  |           |              |                     |
### Table No: 2.3: Association & correlation tolerated time in TMT with selected demographic variables

**Inference:**
1. Demographic variables such as: Age, family income, diet, frequency of fast, frequency of feast, drug indulgence and physical exercise showing an association with tolerated time in TMT.
2. There is No correlation between Tolerated time in TMT and demographic variables.

**Section 3.1.1: Association & Correlation VO2 Max With Selected Clinical Profile.**

| Variable                        | Categor y | VO2 Max | Chi Square (p-value) | Fisher's Exact Significance | Correlation (Kendall’s tau c) |
|---------------------------------|-----------|---------|----------------------|-----------------------------|-----------------------------|
|                                 | Low       | Normal  | High                 |                             |                             |
| family H/o cardiac dis.         | Yes       | 7       | 27                   | 1                           | 2.984 (0.264)               | 0.223 (0.151)               |
|                                 |           | 20.0%   | 77.1%                | 2.9%                        |                             |                            |
|                                 | No        | 23      | 39                   | 3                           |                             |                            |
|                                 |           | 35.4%   | 60.0%                | 4.6%                        |                             |                            |
|                    | Yes | No     | Percentage | Chi-Square Value | p-Value | df | Odds Ratio | 95% CI          |
|--------------------|-----|--------|------------|------------------|---------|----|------------|----------------|
| family H/o respiratory dis. |     |        |            |                  |         |    |            |                |
| Yes                | 8   | 14     | 0          | 1.533            | 0.552   | 0.078 | (0.313)    |                |
| No                 | 22  | 52     | 4          |                  |         |     |            |                |
| co-morbid illness  |     |        |            |                  |         |    |            |                |
| Yes                | 4   | 7      | 1          | 0.812            | 0.425   | 0.001 | (0.991)    |                |
| No                 | 26  | 59     | 3          |                  |         |     |            |                |
| h/o breathing      |     |        |            |                  |         |    |            |                |
| Yes                | 1   | 5      | 0          | 0.924            | 0.737   | -0.024 | (0.506)    |                |
| No                 | 29  | 61     | 4          |                  |         |     |            |                |
| H/o Cough          |     |        |            |                  |         |    |            |                |
| Yes                | 2   | 1      | 0          | 2.010            | 0.319   | 0.046 | (0.252)    |                |
| No                 | 28  | 65     | 4          |                  |         |     |            |                |
| H.R.               |     |        |            |                  |         |    |            |                |
| Normal             | 29  | 62     | 4          | 0.542            | >0.999  | 0.014 | (0.693)    |                |
| Abnormal           | 1   | 4      | 0          |                  |         |     |            |                |
| B.P.               |     |        |            |                  |         |    |            |                |
| Normal             | 25  | 56     | 2          | 3.249            | 0.226   | 0.041 | (0.607)    |                |
| Abnormal           | 5   | 10     | 2          |                  |         |     |            |                |
| Auscultatio n Finding |    |        |            |                  |         |    |            |                |
| Normal             | 28  | 58     | 3          | 1.416            | 0.390   | 0.066 | (0.262)    |                |
| Abnormal           | 2   | 8      | 1          |                  |         |     |            |                |
| Respirator y rate  |     |        |            |                  |         |    |            |                |
| Normal             | 30  | 64     | 4          | 1.051            | >0.999  | 0.021 | (0.162)    |                |
| Abnormal           | 0   | 2      | 0          |                  |         |     |            |                |
| C.C.               |     |        |            |                  |         |    |            |                |
| Normal             | 26  | 60     | 3          | 1.213            | 0.320   | -0.011 | (0.868)    |                |
| Abnormal           | 4   | 6      | 1          |                  |         |     |            |                |
|                          | Normal | Abnormal | Normal | Abnormal | Normal | Abnormal | Normal | Abnormal | Normal | Abnormal | Normal | Abnormal |
|--------------------------|--------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|----------|
| A/P diameter             |        |          |        |          |        |          |        |          |        |          |        |          |
| Normal                   | 29     | 63       | 4      |          | 0.253  | (>0.999) |        |          |        | (>0.999) |        | (0.922)  |
| Abnormal                 | 1      | 3        | 0      |          | 0.003  | (0.999)  |        |          |        | (0.817)  |        |          |
| transverse diameter      |        |          |        |          |        |          |        |          |        |          |        |          |
| Normal                   | 29     | 64       | 4      |          | 0.135  | (>0.999) |        |          |        | (>0.999) |        | (0.889)  |
| Abnormal                 | 1      | 2        | 0      |          | 0.006  | (0.835)  |        |          |        | (0.505)  |        |          |
| Lungs Auscultation finding |      |          |        |          |        |          |        |          |        |          |        |          |
| Normal                   | 28     | 60       | 4      |          | 0.527  | (0.999)  |        |          |        | (0.853)  |        | (0.557)  |
| Abnormal                 | 2      | 6        | 0      |          | 0.039  | (0.831)  |        |          |        | (0.255)  |        |          |
| Height                   |        |          |        |          |        |          |        |          |        |          |        |          |
| Low                      | 4      | 7        | 0      |          | 0.672  | (0.727)  |        |          |        | (0.561)  |        |          |
| Normal                   | 26     | 59       | 4      |          | 0.835  | (0.853)  |        |          |        | (0.557)  |        |          |
| Weight                   |        |          |        |          |        |          |        |          |        |          |        |          |
| Low                      | 6      | 8        | 0      |          | 2.173  | (0.727)  |        |          |        | (0.561)  |        |          |
| Normal                   | 22     | 53       | 4      |          | 0.755  | (0.835)  |        |          |        | (0.557)  |        |          |
| High                     | 2      | 5        | 0      |          | 0.056  | (0.331)  |        |          |        | (0.255)  |        |          |
| BMI                      |        |          |        |          |        |          |        |          |        |          |        |          |
| Low                      | 4      | 12       | 1      |          | 1.661  | (0.835)  |        |          |        | (0.557)  |        |          |
| Normal                   | 20     | 45       | 3      |          | 0.832  | (0.835)  |        |          |        | (0.557)  |        |          |
| High                     | 6      | 9        | 0      |          | −0.079 | (0.238)  |        |          |        | (0.255)  |        |          |
| MUAC                     |        |          |        |          |        |          |        |          |        |          |        |          |
| Low                      | 3      | 7        | 0      |          | 1.006  | (>0.999) |        |          |        | (>0.999) |        | (0.704)  |
| Normal                   | 27     | 58       | 4      |          | 0.015  | (0.704)  |        |          |        | (0.704)  |        |          |
| W.C.                     |        |          |        |          |        |          |        |          |        |          |        |          |
| Low                      | 26     | 55       | 3      |          | 0.870  | (0.908)  |        |          |        | (0.581)  |        |          |
| Normal                   | 31     | 65       | 3      |          | 0.777  | (0.908)  |        |          |        | (0.581)  |        |          |
### Table No:3.1:- Association & Correlation VO$_2$ max With Selected Clinical Profiles

**Inference:**
1. As the p-value for Chi-square and Fisher’s exact test for Skin fold test is less than 0.05 VO$_2$ max is significantly related with Skin fold test.
2. The value of correlation suggests that the VO$_2$ Max is moderately positively correlated with Skin Fold Test.
3. However the p-value for Chi-square and Fisher’s exact test the other physical examination are obtained more than 0.05 no other physical examination finding is significantly related with VO$_2$ max.

### Section 3.1.2:- Association & correlation HRR with selected clinical Profiles.

| Variable                  | Category | Heart Rate Recovery time | Chi Square (p-Value) | Fisher's Exact Significance | Correlation (Kendall's tau c) |
|---------------------------|----------|--------------------------|----------------------|----------------------------|-------------------------------|
|                           | Low      | Normal                   | High                 |                            |                               |
| family H/o cardiac dis.   | Yes      | 9                        | 23                   | 3                          | 0.583 (0.747)                 | 0.746 -0.116 (0.163)          |
|                           | No       | 21                       | 40                   | 4                          |                               |                               |
| family H/o respiratory dis. | Yes   | 8                        | 12                   | 2                          | 0.877 (0.625)                 | 0.575 0.048 (0.525)           |
|                           | No       | 22                       | 51                   | 5                          |                               |                               |
| co-morbid illness         | Yes      | 2                        | 10                   | 0                          | 2.658 (0.311)                 | 0.393 -0.085 (0.054)          |
|                           | No       | 28                       | 53                   | 7                          |                               |                               |
| h/o breathing             | Yes      | 1                        | 4                    | 1                          | 1.224 (0.681)                 | 0.470 0.017 (0.707)           |
|                           | No       | 29                       | 59                   | 6                          |                               |                               |
| H/o Cough                 | Yes      | 1                        | 2                    | 0                          | 0.235 (>0.999)                | >0.999 0.008 (0.794)          |
|                           | No       | 33.3%                    | 66.7%                | 0.0%                        |                               |                               |
|                      | No  |       |      |       |       |       |
|----------------------|-----|-------|------|-------|-------|-------|
|                      | 29  | 61    | 7    |       |       |       |
| H.R. Normal          | 30  | 58    | 7    | 3.091 | 0.317 | 0.012 |
|                      | 31.6% | 61.1% | 7.4% | (0.238) |       | (0.724) |
| Abnormal             | 0   | 5     | 0    | 0.723 | 0.751 | −0.021 |
|                      | 0.0% | 100.0%| 0.0% | (0.751) |       | (0.755) |
| B.P. Normal          | 25  | 53    | 5    | 0.723 | 0.751 | −0.021 |
|                      | 30.1% | 63.9% | 6.0% | (0.751) |       | (0.755) |
| Abnormal             | 5   | 10    | 2    | 0.723 | 0.751 | −0.021 |
|                      | 29.4% | 58.8% | 11.8%| (0.751) |       | (0.755) |
| Auscultating Finding | Normal | 27  | 55    | 7    | 1.081 | >0.999 |
|                      | 30.3% | 61.8% | 7.9% | (0.607) |       | (0.937) |
| Abnormal             | 3   | 8     | 0    | 6.058 | 0.048 | −0.058 |
|                      | 27.3% | 72.7% | 0.0% | (0.048) |       | (0.146) |
| Respiratory rate     | Normal | 30  | 62    | 6    | 6.058 | 0.048 |
|                      | 30.6% | 63.3% | 6.1% | (0.048) |       | (0.146) |
| Abnormal             | 0   | 1     | 1    | 0.0% | 50.0% | 50.0% |
|                      | 0.0% | 50.0% | 50.0%| (0.048) |       | (0.146) |
| C.C. Normal          | 26  | 57    | 6    | 0.384 | 0.671 | −0.004 |
|                      | 29.2% | 64.0% | 6.7% | (0.889) |       | (0.937) |
| Abnormal             | 4   | 6     | 1    | 0.422 | >0.999 |       |
|                      | 36.4% | 54.5% | 9.1% | (>0.999) |       | (0.953) |
| A/P diameter Normal  | 29  | 60    | 7    | 0.422 | >0.999 |       |
|                      | 30.2% | 62.8% | 7.3% | (>0.999) |       | (0.953) |
| Abnormal             | 1   | 3     | 0    | 0.384 | 0.671 | −0.004 |
|                      | 25.0% | 75.0% | 0.0% | (>0.999) |       | (0.937) |
| transverse diameter  | Normal | 29  | 61    | 7    | 0.235 | >0.999 |
|                      | 29.9% | 62.9% | 7.2% | (>0.999) |       | (0.794) |
| Abnormal             | 1   | 2     | 0    | 4.913 | 0.128 | −0.036 |
|                      | 33.3% | 66.7% | 0.0% | (0.107) |       | (0.501) |
| Lungs Auscultating Finding | Normal | 29  | 58    | 5    | 0.384 | 0.671 |
|                      | 31.5% | 63.0% | 5.4% | (0.889) |       | (0.479) |
| Abnormal             | 1   | 5     | 2    | 2.265 | 0.671 | 0.005 |
|                      | 12.5% | 62.5% | 25.0%| (0.710) |       | (0.930) |
| Height Low           | 4   | 6     | 1    | 0.384 | 0.671 | −0.035 |
|                      | 36.4% | 54.5% | 9.1% | (0.889) |       | (0.479) |
| Normal               | 26  | 57    | 6    | 2.265 | 0.671 | 0.005 |
|                      | 29.2% | 64.0% | 6.7% | (0.710) |       | (0.930) |
| Weight Low           | 5   | 7     | 2    | 2.265 | 0.671 | 0.005 |
|                      | 35.7% | 50.0% | 14.3%| (0.710) |       | (0.930) |
| Normal               | 23  | 51    | 5    | 2.265 | 0.671 | 0.005 |
|                      | 29.1% | 64.6% | 6.3%| (0.710) |       | (0.930) |
| High                 | 2   | 5     | 0    | 2.265 | 0.671 | 0.005 |
|                      | 28.6% | 71.4% | 0.0%| (0.710) |       | (0.930) |
| BMI Low              | 4   | 11    | 2    | 1.150 | 0.856 | −0.062 |
|                      | 23.5% | 64.7% | 11.8%| (0.911) |       | (0.340) |
| Normal               | 22  | 42    | 4    | 1.150 | 0.856 | −0.062 |
|                      | 32.4% | 61.8% | 5.9%| (0.911) |       | (0.340) |
### Table No:3.2: Association & Correlation HRR With Selected Clinical Profiles

| Variable                     | Categor y | Tolerated Time in TMT | Chi Square (p-Value) | Fisher's Exact Significance | Correlation (Kendall's tau c) |
|------------------------------|-----------|-----------------------|----------------------|-----------------------------|-----------------------------|
|                              | Low       | Normal                | High                 |                             |                             |
| MUAC                         | High      | 4                     | 10                   | 1                           |                             |
| Low                          | 2         | 7                     | 1                    | 2.885 (0.548)               | 0.469                      | -0.041                      |
| Normal                       | 27        | 56                    | 6                    |                             |                             |                             |
| High                         | 1         | 0                     | 0                    |                             |                             |                             |
| W.C.                         | Low       | 25                    | 52                   | 7                           | 1.451 (0.899)              | 0.927                      | 0.010 (0.837)              |
| Normal                       | 4         | 9                     | 0                    |                             |                             |                             |
| High                         | 1         | 2                     | 0                    |                             |                             |                             |
| H.C.                         | Low       | 21                    | 46                   | 5                           | 0.748 (0.990)              | 0.884                      | -0.008 (0.887)             |
| Normal                       | 7         | 12                    | 1                    |                             |                             |                             |
| High                         | 2         | 5                     | 1                    |                             |                             |                             |
| Skin Fold Test               | Normal    | 29                    | 55                   | 7                           | 2.921 (0.292)              | 0.413                      | 0.054 (0.184)              |
| Abnormal                     | 1         | 8                     | 0                    |                             |                             |                             |

**Inference:**
1. As the p-value for Chi-square and Fisher’s exact test for Respiratory rate is less than 0.05 it is obtained that Heart recovery rate time is associated with the Respiratory rate.
2. The value of correlation suggests that the Heart recovery rate is slightly negatively correlated with Respiratory rate.
3. All the other p-values are more than 0.05 therefore no other physical examination finding is significantly related with Heart recovery rate time.

**Section 3.1.3:** Association & correlation Tolerated time in TMT with selected clinical Profiles.
| h/o breathing | Yes | No | p-value | Odds ratio | 95% CI | p-value | Odds ratio | 95% CI |
|---------------|-----|----|---------|------------|--------|---------|------------|--------|
| breathing     | 2   | 25 | 0.184   | (>0.999)   | 0.683  | (0.338) | -0.046     | (0.753) |
| h/o Cough     | Yes | 1  | 0.089   | (>0.999)   | >0.999 | 0.010  | (0.730)    | 0.046   | (0.845) |
| h/o Cough     | No  | 26 | 0.195   | (>0.999)   | >0.999 | 0.046  | (0.370)    | 0.046   | (0.845) |
| H.R.          | Normal | 26 | 0.255   | (>0.999)   | 0.813  | (0.735) | 0.026      | 0.046   | (0.213) |
| H.R.          | Abnormal | 5  | 0.125   | (>0.999)   | >0.999 | -0.020 | (0.767)    | -0.020  | (0.767) |
| B.P.          | Normal | 22 | 0.053   | (>0.999)   | 0.705  | (0.115) | 0.092      | 0.092   | (0.115) |
| B.P.          | Abnormal | 2  | 1.955   | (0.673)    | 0.673  | (0.670) | -0.030     | -0.030  | (0.670) |
| Auscultation finding | Normal | 24 | 0.053   | (>0.999)   | 0.705  | (0.115) | 0.092      | 0.092   | (0.115) |
| Auscultation finding | Abnormal | 1  | 1.955   | (0.673)    | 0.673  | (0.670) | -0.030     | -0.030  | (0.670) |
| Respiratory rate | Normal | 25 | 0.053   | (>0.999)   | 0.705  | (0.115) | 0.092      | 0.092   | (0.115) |
| Respiratory rate | Abnormal | 2  | 1.955   | (0.673)    | 0.673  | (0.670) | -0.030     | -0.030  | (0.670) |
| C.C.          | Normal | 24 | 0.053   | (>0.999)   | 0.705  | (0.115) | 0.092      | 0.092   | (0.115) |
| C.C.          | Abnormal | 3  | 1.955   | (0.673)    | 0.673  | (0.670) | -0.030     | -0.030  | (0.670) |
| A/P diameter  | Normal | 26 | 0.053   | (>0.999)   | 0.705  | (0.115) | 0.092      | 0.092   | (0.115) |
| A/P diameter  | Abnormal | 1  | 1.955   | (0.673)    | 0.673  | (0.670) | -0.030     | -0.030  | (0.670) |
| transverse diameter | Normal | 26 | 0.053   | (>0.999)   | 0.705  | (0.115) | 0.092      | 0.092   | (0.115) |
| transverse diameter | Abnormal | 1  | 1.955   | (0.673)    | 0.673  | (0.670) | -0.030     | -0.030  | (0.670) |
| Lungs Auscultation finding | Normal | 24 | 0.053   | (>0.999)   | 0.705  | (0.115) | 0.092      | 0.092   | (0.115) |
| Lungs Auscultation finding | Abnormal | 3  | 1.955   | (0.673)    | 0.673  | (0.670) | -0.030     | -0.030  | (0.670) |
| Height        | Low  | 2  | 0.645   | (0.753)    | 0.753  | (0.767) | 0.020      | 0.020   | (0.767) |
| Height        | Normal | 25 | 0.645   | (0.753)    | 0.753  | (0.767) | 0.020      | 0.020   | (0.767) |
| Weight        | Low  | 4  | 0.291   | (>0.999)   | >0.999 | -0.006 | (0.929)    | 0.020   | (0.767) |
| Weight        | Normal | 21 | 0.291   | (>0.999)   | >0.999 | -0.006 | (0.929)    | 0.020   | (0.767) |
| BMI           | Low  | 4  | 1.955   | (0.673)    | 0.673  | (0.670) | -0.030     | -0.030  | (0.670) |
| BMI           | Normal | 17 | 1.955   | (0.673)    | 0.673  | (0.670) | -0.030     | -0.030  | (0.670) |
Table No:3.3:- Association & Correlation Tolerated time in TMT With Selected Clinical Profiles

Inference:
1. As the p-value for Chi-square and Fisher’s exact test are more than 0.05 therefore no physical examination finding is significantly related with Tolerated Time in TMT.
2. There is no correlation between Tolerated time in TMT and Clinical Profiles

Section 3.2.1:- Association & correlation VO2 Max with selected Diagnostic Tests.

| Variable          | Category | VO2 Max | Chi-Square (p-value) | Fisher's Exact Significance | Correlation (Kendall’s tau c) |
|-------------------|----------|---------|----------------------|----------------------------|-------------------------------|
|                   |          | Low     | Normal               | High                       |                               |
| a) Hemoglobin     | Low      | 10      | 24                   | 1                          | 4.978                         | 0.296                         | -0.033 (0.644)                |
|                   | Normal   | 18      | 42                   | 3                          | 28.6%                         | 68.6%                         | 2.9%                          |
|                   | High     | 2       | 0                    | 0                          | 28.6%                         | 66.7%                         | 4.8%                          |
|                   |          | 100.0%  | 0.0%                 | 0.0%                       |                               |                               |                               |
| b) Triglyceride   | Low      | 0       | 1                    | 0                          | 4.056                         | 0.179                         | -0.052 (0.334)                |
|                   | Normal   | 25      | 61                   | 3                          | 28.1%                         | 68.5%                         | 3.4%                          |
|                   | High     | 5       | 4                    | 1                          | 50.0%                         | 40.0%                         | 10.0%                         |
|   | c) HDL | d) LDL | e) Cholesterol | f) RBS | g) T3 | h) T4 | i) TSH | j) ECG | k) Uric Acid |
|---|---------|--------|----------------|-------|------|------|-------|-------|-------------|
|   | Low     | Normal | High           | Low   | Normal | High | Low   | Normal | High        |
|   |         |        |                |       |       |      |       |        |             |
|   | 8       | 14     | 8              | 3     | 23    | 4    | 4     | 27    | 2           |
|   | 10      | 37     | 7              | 2     | 57    | 7    | 4     | 61    | 1           |
|   | 2       | 2      | 0              | 2     | 2     | 0    | 1     | 4     | 0           |
|   | 40.0%   | 26.4%  | 29.6%          | 42.9% | 28.0% | 36.4%| 0.0%  | 0.0%  | 66.7%       |
|   | 50.0%   | 69.8%  | 70.4%          | 28.6% | 69.5% | 63.6%| 0.0%  | 100.0%| 33.3%       |
|   | 10.0%   | 3.8%   | 0.0%           | 28.6% | 2.4%  | 0.0% | 0.0%  | 0.0%  | 0.0%        |
|   |         |        |                |       |       |      |       |        |             |
|   |        |        |                |       |       |      |       |        |             |
|   | 4.752 (0.314) | 13.792 (0.019) | 3.559 (0.411) | 5.982 (0.251) | 3.095 (0.498) | 1.997 (0.669) | 2.236 (0.629) | 0.873 (0.584) | 1.719 (0.751) |
|   | 0.307 (0.928) | 0.042 (0.024) | 0.347 (0.086) | 0.217 (0.210) | 0.490 (0.062) | 0.550 (0.156) | 0.045 (0.205) | 0.559 (0.367) | 0.751 (0.484) |
|   | 0.007 (0.24)  |         |                |       |       |      |       |        |             |
|   |         |        |                |       |       |      |       |        |             |
|   |         |        |                |       |       |      |       |        |             |
|   |         |        |                |       |       |      |       |        |             |
### Table No: 4.1: Association & correlation VO₂Max with selected Diagnostic Tests

**Inference:**
1. As the p-value for Chi-square and Fisher’s exact test for LDL is less than 0.05 it is obtained that LDL is related with VO₂ max.
2. The value of correlation suggests that the LDL is moderately negatively correlated with VO₂ Max.
3. P-values for all other variables are more than 0.05 therefore no other Diagnostic test finding is significantly related with VO₂ max.

**Section 3.2.2:** Association & correlation HRR with selected Diagnostic Tests.

| Variable          | Category | Heart Rate Recovery | Chi-Square (p-value) | Fisher's exact Significance | Correlation (Kendall’s tau c) |
|-------------------|----------|---------------------|----------------------|-----------------------------|--------------------------------|
|                   |          | Low | Normal | High                      |                               |                                |
| a) Hemoglobin     | Low      | 0.782 (0.939)       | 0.838                | −0.007 (0.925)              |                                |
|                   | Normal   | 3.600 (0.374)       | 0.501                | −0.023 (0.623)              |                                |
|                   | High     | 13.739 (0.008)      | 0.005                | 0.203 (0.016)               |                                |
| b) Triglyceride level | Low     | 5.307 (0.241)       | 0.248                | −0.083 (0.156)              |                                |
|                   | Normal   | 28.7% | 66.7% | 4.6%                      |                                |
| Procedure       | High  | Normal | Low  | 28.0% | 64.6% | 7.3% |
|-----------------|-------|--------|------|-------|-------|------|
| Cholesterol     | 6     | 20     | 8    | 54.5% | 36.4% | 9.1% |
| RBS             | 2     | 27     | 2    | 36.4% | 54.5% | 9.1% |
| T3              | 1     | 1      | 0    | 25.0% | 75.0% | 0.0% |
| T4              | 0     | 29     | 1    | 50.0% | 100.0%| 0.0% |
| TSH             | 1     | 28     | 1    | 50.0% | 50.0% | 0.0% |
| ECG             | 30    | 55     | 6    | 30.5% | 63.2% | 6.3% |
| Uric Acid       | 3     | 5      | 0    | 8.644 | 0.016 | >0.999|
| X-Ray Chset     | 1     | 7      | 0    | 0.0%  | 50.0% | 0.0% |
| 2D Echo         | 4     | 9      | 1    | 28.6% | 64.3% | 7.1% |
| 2D Echo         | 2     | 5      | 0    | 28.6% | 71.4% | 0.0% |
| X-Ray Chset     | 30    | 61     | 7    | 30.6% | 62.2% | 7.1% |
| 2D Echo         | 30    | 60     | 7    | 30.9% | 61.9% | 7.2% |

### Statistical Information

- **Chi-Square Test**: 3.107, 3.768, 3.520, 8.644, 2.765, 0.016, 2.138, 1.199, 1.816, >0.999
- **P-Value**: 0.491, 0.292, 0.472, 0.113, 0.563, >0.999, 0.817, 0.018, 0.638, 0.028
Abnormal

| n) Peak Expiratory Flow Rate | Normal | Abnormal |
|-------------------------------|--------|----------|
|                               | 29     | 1        |
|                               | 62     | 1        |
|                               | 7      | 0        |
|                               | 29.6%  | 50.0%    |
|                               | 63.3%  | 50.0%    |
|                               | 7.1%   | 0%       |
|                               | 0.470  | 0.0%     |
|                               | (>0.999)|         |
|                               | 0.605  | 0.019    |
|                               | (0.518)|         |

Table 4.2: Association & correlation HRR with selected Diagnostic Tests.

Inference:
1. As the p-value for Chi-square and Fisher’s exact test for HDL is less than 0.05 it is obtained that HDL is related with Heart rate recovery time.
2. The value of correlation suggests that the HDL is moderately positively correlated with Heart rate recovery time.
3. P-values for all other variables are more than 0.05 therefore no other Diagnostic test finding is significantly related with Heart rate recovery time.

Section 3.2.3: Association & correlation Tolerated time in TMT with selected Diagnostic Tests.

| Variable | Category | Tolerated Time in TMT | Chi Square (p-Value) | Fisher's Exact Significance | Correlation (Kendall’s tau c) |
|----------|----------|------------------------|----------------------|-----------------------------|-------------------------------|
|          |          | Low                   | Normal               | High                        |                               |
| a) Hemoglobin | Low      | 10                    | 24                   | 1                           | 2.713                         | 0.548                         | 0.012                         |
|           |          | 28.6%                  | 68.6%                | 2.9%                        |                               |                               | (0.852)                       |
|           | Normal   | 17                    | 46                   | 0                           |                               |                               |                               |
|           |          | 27.0%                  | 73.0%                | 0.0%                        |                               |                               |                               |
|           | High     | 0                     | 2                    | 0                           |                               |                               |                               |
|           |          | 0.0%                   | 100.0%               | 0.0%                        |                               |                               |                               |
|           |          |                       |                      |                             |                               |                               |                               |
| b) Triglyceride level | Low      | 0                     | 1                    | 0                           | 0.542                         | >0.999                        | >0.999                         | -0.018                       |
|           |          | 0.0%                   | 100.0%               | 0.0%                        |                               |                               |                               | (0.662)                       |
|           | Normal   | 24                    | 64                   | 1                           |                               |                               |                               |                               |
|           |          | 27.0%                  | 71.9%                | 1.1%                        |                               |                               |                               |                               |
|           | High     | 3                     | 7                    | 0                           |                               |                               |                               |                               |
|           |          | 30.0%                  | 70.0%                | 0.0%                        |                               |                               |                               |                               |
| c) HDL     | Low      | 6                     | 14                   | 0                           | 3.060                         | 0.685                         | 0.060                         |
|           |          | 30.0%                  | 70.0%                | 0.0%                        |                               |                               |                               | (0.401)                       |
|           | Normal   | 15                    | 38                   | 0                           |                               |                               |                               |                               |
|           |          | 28.3%                  | 71.7%                | 0.0%                        |                               |                               |                               |                               |
|           | High     | 6                     | 20                   | 1                           |                               |                               |                               |                               |
|           |          | 22.2%                  | 74.1%                | 3.7%                        |                               |                               |                               |                               |
| d) LDL     | Low      | 1                     | 6                    | 0                           | 1.512                         | 0.740                         | 0.002                         |
|           |          | 14.3%                  | 85.7%                | 0.0%                        |                               |                               |                               | (0.957)                       |
|           | Normal   | 24                    | 57                   | 1                           |                               |                               |                               |                               |
|           |          | 29.3%                  | 69.5%                | 1.2                         |                               |                               |                               |                               |
|        |        |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|--------|
|        | High   | 2      | 9      | 0      | 18.2%  | 81.8%  | 0.0    |
|        | Normal | 19     | 55     | 1      | 25.3%  | 73.3%  | 1.3    |
|        | High   | 1      | 2      | 0      | 33.3%  | 66.7%  | 0.0    |
| e)     | Cholesterol | Low   | 7      | 15     | 0      | 31.8%  | 68.2%  | 0.0    |
|        | Normal | 25     | 66     | 1      | 27.2%  | 71.7%  | 1.1    |
|        |        | 0      | 4      | 0      | 0.0%   | 100.0% | 0.0    |
|  f)    | RBS    | Low    | 2      | 2      | 0      | 50.0%  | 50.0%  | 0.0    |
|        | Normal | 25     | 66     | 1      | 27.2%  | 71.7%  | 1.1    |
|        |        | 0      | 2      | 0      | 0.0%   | 100.0% | 0.0    |
|  g)    | T3     | Low    | 2      | 3      | 0      | 40.0%  | 60.0%  | 0.0    |
|        | Normal | 25     | 67     | 1      | 26.9%  | 72.0%  | 1.1    |
|        |        | 0      | 2      | 0      | 0.0%   | 100.0% | 0.0    |
|  h)    | T4     | Low    | 0      | 3      | 0      | 0.0%   | 100.0% | 0.0    |
|        | Normal | 27     | 67     | 1      | 28.4%  | 70.5%  | 1.1    |
|        |        | 0      | 2      | 0      | 0.0%   | 100.0% | 0.0    |
|  i)    | TSH    | Low    | 1      | 1      | 0      | 50.0%  | 50.0%  | 0.0    |
|        | Normal | 25     | 64     | 1      | 27.8%  | 71.1%  | 1.1    |
|        |        | 1      | 7      | 0      | 12.5%  | 87.5%  | 0.0    |
|  j)    | ECG    | Normal | 23     | 62     | 1      | 26.7%  | 72.1%  | 1.2    |
|        |        | 4      | 10     | 0      | 28.6%  | 71.4%  | 0.0    |
| Table 4.3: Association & correlation of Tolerated time in TMT with selected Diagnostic Tests. |
|-----------------------------------------------|
| **k) Uric Acid** | Low | % | Normal | 24 | 62 | 1 | 4.398 (0.226) | 0.226 | 0.091 (0.260) |
| | % | % | 0.0% | 100.0 | 0.0% | % | 27.6% | 71.3% | 1.1% | 0.0% | 100.0 | 0.0% | % |
| High | 3 | 3 | 50.0% | 50.0% | 0.0% | % |
| **l) X-Ray Chest** | Normal | 27 | 70 | 1 | 0.794 (0.607) | 0.607 | 0.021 (0.158) |
| | Abnormal | 0 | 2 | 0 | 0.0% | 100.0 | 0.0% | % | 27.6% | 71.4% | 1.0% | % |
| **m) 2D Echo** | Normal | 24 | 72 | 1 | 8.362 (0.048) | 0.048 | 0.190 (0.037) |
| | Abnormal | 3 | 0 | 0 | 100.0 | 0.0% | 0.0% | % |
| **n) Peak Expiratory Flow Rate** | Normal | 25 | 72 | 1 | 5.518 (0.091) | 0.091 | 0.058 (0.146) |
| | Abnormal | 2 | 0 | 0 | 100.0 | 0.0% | 0.0% | % |

**Inference:**
1. As the p-value for Chi-square and Fisher’s exact test for 2D Echo is less than 0.05 the tolerated time in TMT is significantly related with 2D Echo.
2. The value of correlation suggests that the 2D Echo is moderately positively correlated with tolerated time in TMT.
3. For other variables the p-value for Chi-square and Fisher’s exact test are more than 0.05 therefore no other Diagnostic test finding is significantly related with Tolerated time in TMT.

**Discussion:**
The study results projects that a clear association and correlation of cardio-respiratory determinants (VO2 max, HRR & Tolerated time in TMT) with selected demographic variables. In the aspect of demographic variables: Family income is showing a significant association with VO2 Max and it’s showing moderate positive correlation with VO2 Max. The study also giving the evidences of significant association and correlation of cardio-respiratory determinants (VO2 max HRR and Tolerated time in TMT) with selected diagnostic test findings. Such as LDL is showing moderate negative correlation & selected clinical profile such as skinfold test is showing a moderate positive correlation with VO2 Max. HDL in the prime parameter of diagnostic findings which is showing a relation with HRR. In The aspect of tolerated time in TMT is showing an association and moderate positive correlation with 2D Echo. These results statistically proving H1, H2, H3. That means there is a significant association and correlation of cardio-respiratory determinants (VO2 max, HRR & Tolerated time in TMT) with selected physical examination findings and There is a significant association and correlation of cardio-respiratory determinants (VO2 max, HRR & Tolerated time in TMT) with selected diagnostic tests findings.
Implications:
The findings of present study has been bused in medical practice, medical education, and administration and research.
1. **Nursing practice:** The studies information can be converted into information Education Communication system for nurses who were working in clinical settings. They can educate the young adults regarding the importance of cardiopulmonary fitness
2. **Nursing Administration:** The nurse administrator should promote the staff nurses regarding applications of this study result in the aspect of providing awareness to the peoples belongs to the particular age group.
3. **Nursing education & Nursing research:** The collected data can be shared to the concern authorities institution to overcome the barrier and for the effective utilization of in the study in promoting health and wellness and also This information can be disseminated to the medical fraternity who were working in various institutions of India

Recommendations:-
On the basis of findings of the study, the following recommendations are being made: A similar study can be replicated on a large sample to generalize the findings. An experimental study can be undertaken with control group for effective comparison. A similar kind of study can be conducted using true experimental design so that generalization could be made.

Conclusion:-
The study results projects that a clear association and correlation of cardio-respiratory determinants (VO2 max, HRR & Tolerated time in TMT) with selected demographic variables and other parameters such as clinical profiles and diagnostic tests.

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