



INDIANS AT RISK - A STUDY ABOUT AWARENESS, CHALLENGES AND SOLUTIONS ON DIET AND EXERCISE AMONG TELUGU SPEAKING SOUTH INDIANS LIVING IN UNITED KINGDOM AND INDIA

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INTRODUCTION

Higher income levels and globalisation have induced a nutritional shift resulting in the rise of eating unhealthy food and decreased intake of fruits and vegetables and this coupled with reduced physical activity gives rise to risk factors like obesity leading to some of the major non-communicable diseases (NCD's) like Type-2 Diabetes, Cardiovascular disease, some Cancers etc. What is the net gain if the benefits of modernisation and economic growth are cancelled out by the costs like medical bills, lost productivity, premature death by a preventable disease? Unhealthy diet and physical inactivity, two risk factors among four that include tobacco use and harmful use of alcohol are central to this study. All four risk factors lie in non-health sectors and thus combating them is challenging and requires multi-sectoral collaboration.

METHOD

A questionnaire called "Do you know? Do you do?" was designed based on important evidence based facts related to diet and physical activity to test awareness and know their practices, challenges and probable solutions that might help them to start and stick to healthy lifestyle.

This questionnaire was made using google forms and was sent out to Telugu speaking South Indians living in India and in the UK via community groups on WhatsApp. Questions are both open and closed ended so that it is easy for them to answer and they can add if they want to state anything else. In the questionnaire if there are any terms that are supposed to be difficult for lay men, that term was explained just underneath that question with examples in order to enable people to answer questions correctly. For example, ultra-processed foods, processed meat, BMI, PUFA, MUFA, saturated fats, trans-fats, whole grain cereals, complex carbohydrates etc.

Pregnant women and lactating mothers were excluded from the survey by asking them not to participate. Individuals aged 20-70 years were requested to participate. All recorded responses were carefully analyzed to draw inferences after comparison based on location, gender, etc.

INDIANS ARE AT RISK

- India has more than 69 million people with diabetes (T2) and these numbers are expected to rise to 140 million by 2040 and almost half of them remain undiagnosed.^[1] Moreover, Asian Indians have highest incidence rates of prediabetes and diabetes. Among all major ethnic groups, the conversion from prediabetes to diabetes occurs more rapidly in this population.^[2]
- NCD's are rapidly increasing in India causing nearly 5.8 million deaths per year and primary reasons for rise of NCD's in India are nutrition and lifestyle transitions. NCD's accounted for 60% of all deaths and 44% of disability adjusted life years (DALY's) lost in 2011.^[3] The common NCD's are interlinked; for instance it is estimated that about 44% of the diabetes burden and 23% of the CVD burden can be attributed to overweight and obesity in India.^[4-6]
- India has the highest prevalence of metabolic syndrome and obesity with 70 million being obese projected by 2025.^[7] Abdominal obesity in Asian Indians has been recognised as an important risk factor for T2DM and CVD.
- Reports on CAD (Coronary Artery Disease) in India from different parts of the world have shown that Asian Indians are at 3-4 times higher risk of CAD than White Americans, 6 times higher risk than Chinese and 20 times higher than Japanese.^[8-11] According to World Health Report 2002, CVD's

(Cardiovascular Diseases) will be the largest cause of death and disability in India by 2020. It is noteworthy to mention that in Asian Indians, morbidity and mortality from CVD is occurring in people with lower BMI and smaller waist circumference. Thus intra-abdominal visceral fat is accumulating in Indians without developing generalised obesity.^[12]

- Obesity in South Asians has certain characteristic features. For any given level of BMI, South Asians tend to have higher body fat, abdominal fat, liver fat, pancreatic fat and lower lean mass along with increased insulin resistance and dysmetabolic state than Whites.^[13,14]

Diet

'INTERHEART' study has shown that Asian Indians in comparison to people residing in 47 non-South Asian Countries had a lower intake fruits and vegetables^[15], higher intake of refined cereals such as polished white rice which have shown to increase the risk of T2DM and metabolic syndrome in this population.^[16]

The rate of consumption of fruits and vegetables is low in India, this is contrary to the perception that Indians, being predominantly vegetarians would consume adequate quantities of fruits and vegetables. The National Family Health Survey-3 (NFHS-3), a large nationally representative cross-sectional survey covering 156316 individuals self-reported data in India on consumption of fruits and vegetables reported that half of the population in its survey consumed zero or only 1 serving of fruit in a week.^[17] In addition, the vegetables that are consumed are often overcooked in Indian meals, leading to vital loss of micronutrients.^[18]

Time-series data on nutrient intake captured from the National Sample Survey Organization surveys indicate that despite no significant change in total calorie consumption from 1972-2000, Indians fat intake increased from 24-36g/day and from 36-50 g/day in rural and urban individuals respectively. Although the percentage of carbohydrate intake has remained relatively constant, the consumption of refined grain products increased in comparison with the consumption of whole grains.^[17] Partially hydrogenated vegetable oils with high transfat content contribute to a significant proportion of total fat intake in Indians.^[19]

It has been observed that the use of ghee (clarified butter), vegetable ghee (partially hydrogenated vegetable oil, popularly known as Vanaspati) and coconut oil, with high content of saturated fatty acids, trans fatty acids in cooking may also contribute to dysmetabolic state in South Asians.^[20] The intake of saturated fatty acids, omega-6-PUFA and trans fatty acids is higher and that of omega-3-PUFA lower in Asian Indians as compared to other population.^[21]

CVD mortality rates have positive correlation with dietary consumption of fats, milk and its products and sugars, negative correlation with intake of green leafy vegetables.^[15]

Increase in sugar consumption from both traditional sources and from sugar sweetened beverages has been recorded in India.^[22]

Physical activity

Data from various parts of India have shown a steady increase in the prevalence of lifestyle related diseases such as T2DM (Type 2 Diabetes Mellitus), metabolic syndrome, HTN (Hypertension), CHD (Coronary Heart Disease) etc., frequently in association with overweight or obesity. Comparative data show that Asian Indians are more sedentary than white Caucasians.

Physical activity is lower in Asian Indians in comparison with other ethnic groups.^[13] Studies on immigrant South Indians in U.S. have shown that only 51.8% were physically active.^[23] A study conducted on Asian Indians in UK also showed that 67.62% were sedentary.^[24] The level of recreational physical activity was also reported to be low.^[25]

Data on physical activity in India are sparse. The ICMR-INDIA B (The Indian Council of Medical Research – India diabetes study) is a large cross-sectional survey with data from 3 different states. It assessed physical activity using Global Physical Activity questionnaire in 14,227 individuals aged >20 years and 1 of every 2 individuals were considered physically inactive.^[25]

Asian Indians and South Asian women are also not able to engage in daily exercise^[26] and do not appreciate the mode and intensity of activity that is appropriate.^[27]

Measures of sedentary lifestyles or physical inactivity have been associated with 1.5-2.4 fold elevation in CHD risk.^[28] Risk of CHD decreases across levels of leisure time exercise with people exercising the equivalent of 36 minutes of brisk walking per day having less than half the risk of non-exercisers. There was an association between increased sedentary activity and CHD risk. The equivalent of 3.6 hours per day of sedentary activity was associated with nearly a 90% increase in risk.^[29]

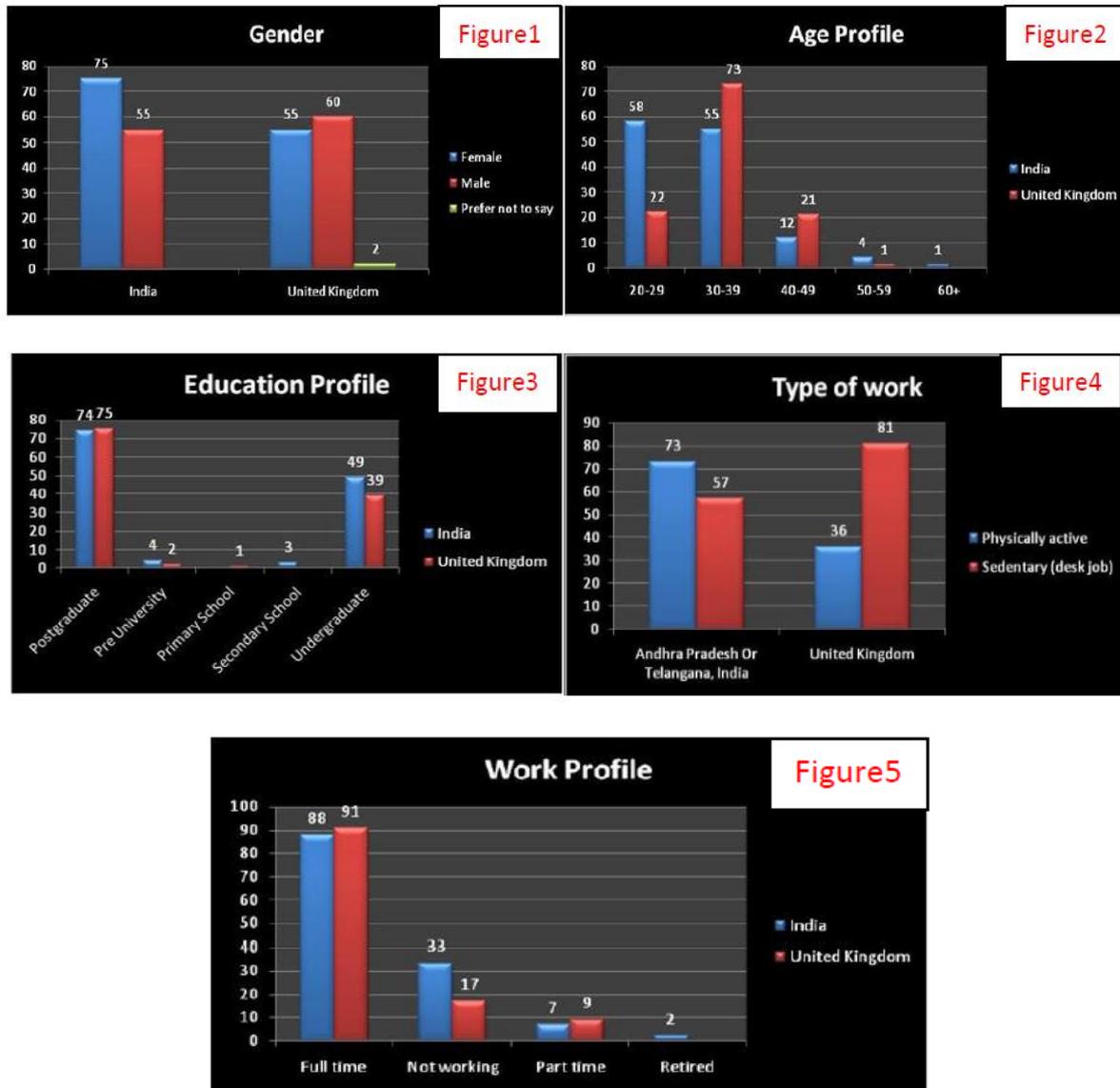
South Asians during exercise had lower cardio-respiratory fitness and capacity for fat oxidation compared with matched Europeans. So, a total of 60 minutes of physical activity per day is recommended for healthy Asian Indians and this should include at least 30 minutes of moderate intensity aerobic activity, 15 minutes of work related activity, and 15 minutes of muscle strengthening exercises.

RESULTS

Out of 247 participants, 117 are based in UK and 130 are residing in India.

Demographics- Gender, Age, Education and Type of work are portrayed in Figure 1,

Figure 2, Figure 3 and Figure 4 and 5 respectively. In the UK, two-thirds are doing sedentary jobs while in India less than half are doing sedentary jobs.



More than 3/4th (80.2%) of the people are married or in a relationship, 19.4% are single and only 1 individual is divorced.

Majority of the participants (71.3%) said they don't have prediabetes, diabetes, high cholesterol, high blood pressure, high BMI, cardiovascular disease, cancers and

precancerous conditions, while 9.7% said they don't know if they have any.

Among the people who participated in the survey, please find in the table below, number of persons that have reported to have the conditions.

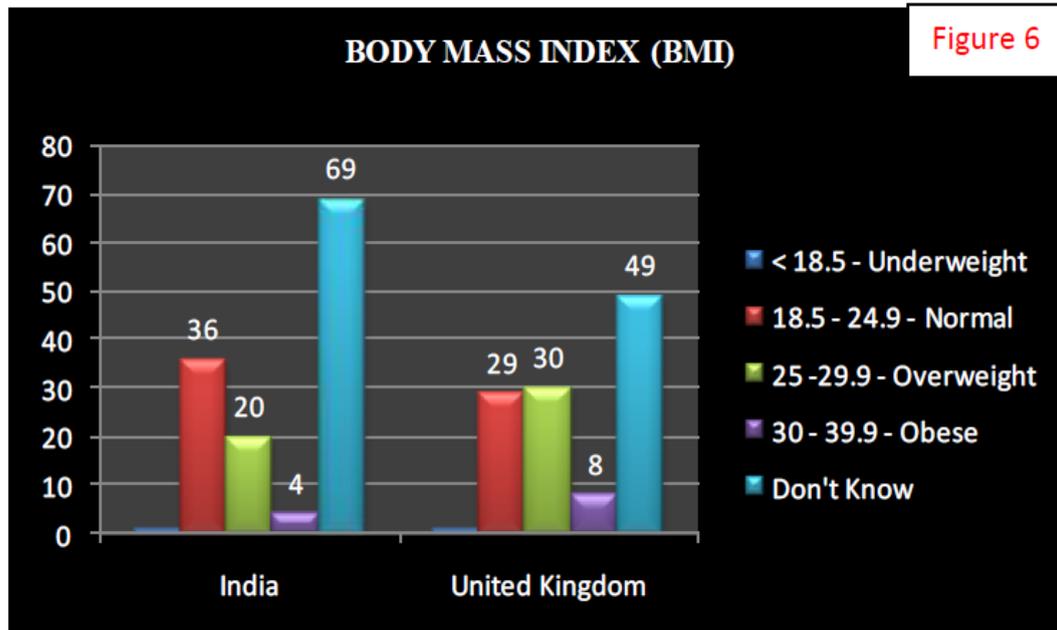
Condition	India	United Kingdom
High BMI	7	15
Pre-diabetes	1	4
Diabetes	5	4
High cholesterol	6	7
High Blood Pressure	2	3

- People with high BMI are double in UK than in India.
- Prediabetes in India and UK: The person who has reported to have prediabetes in India is a sedentary worker and in UK all 4 persons reported to have been doing sedentary jobs.
- Diabetes in India and UK: Among 5 people with diabetes in India, 4 people said they are physically active and 1 person is a sedentary worker. Whereas in UK, out of 4 diabetics, only 1 person said he's physically active whilst others are sedentary

workers.

○ BMI

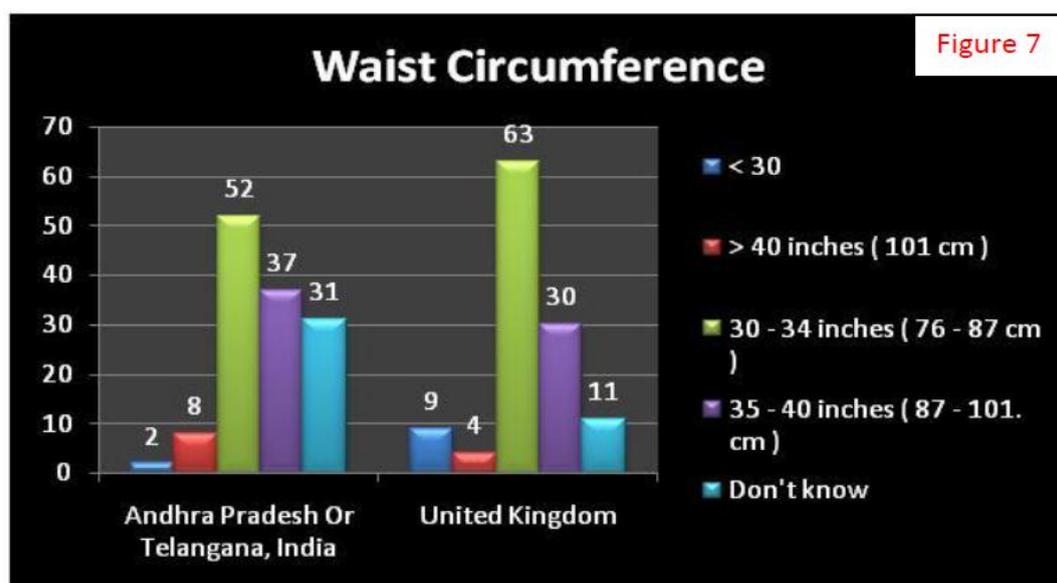
- More than half in UK know their BMI but less than half in India are aware.
- Awareness is more among males in UK.
- Out of 129 people who said to have known their BMI (Figure 6), half of the people are at risk as they belong to either overweight or obese category.



○ Waist Circumference(WC)

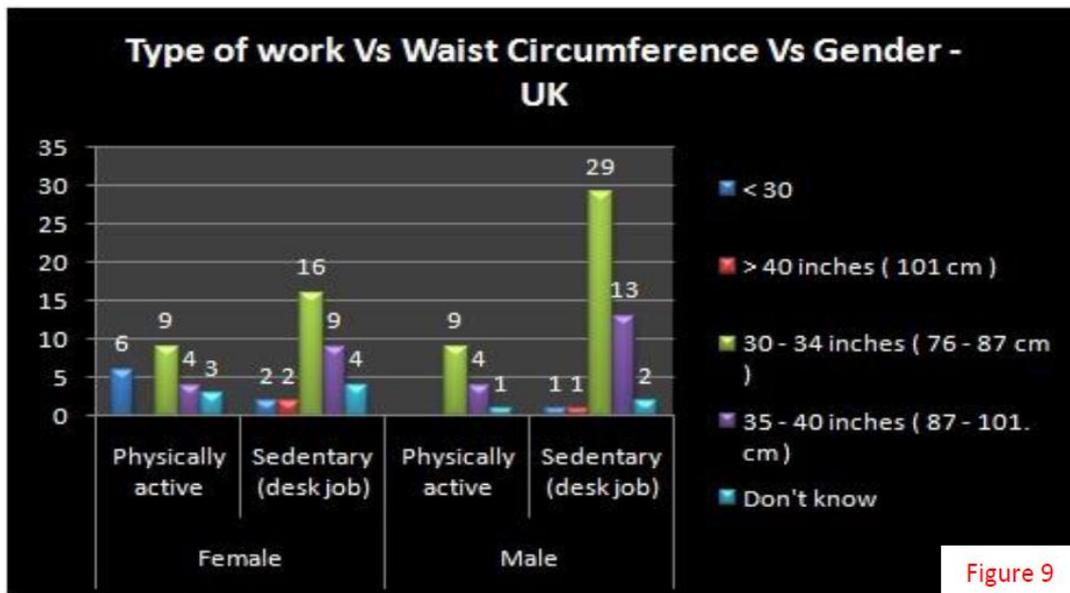
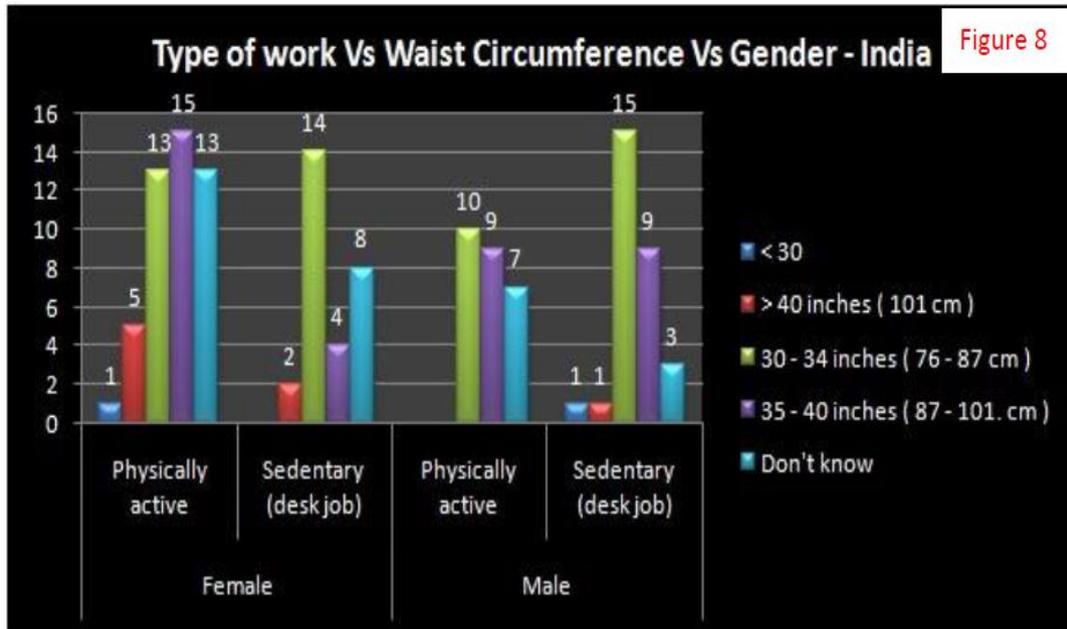
- One-third of the participants are at risk as they had WC>35 inches (Figure 7).
- People in UK are more aware of their WC.

- More number of people in India, especially females are not aware of their WC.



○ **WC Vs Type of work Vs Gender**

- In India, people who have said they are physically active have more waist circumference, where as in UK, people who are sedentary have more waist circumference.
- None of the physically active job holders in UK had waist circumference > 40 inches.
- Females at risk with waist circumference >35 inches are more in India than UK (Figure 8 and Figure 9).



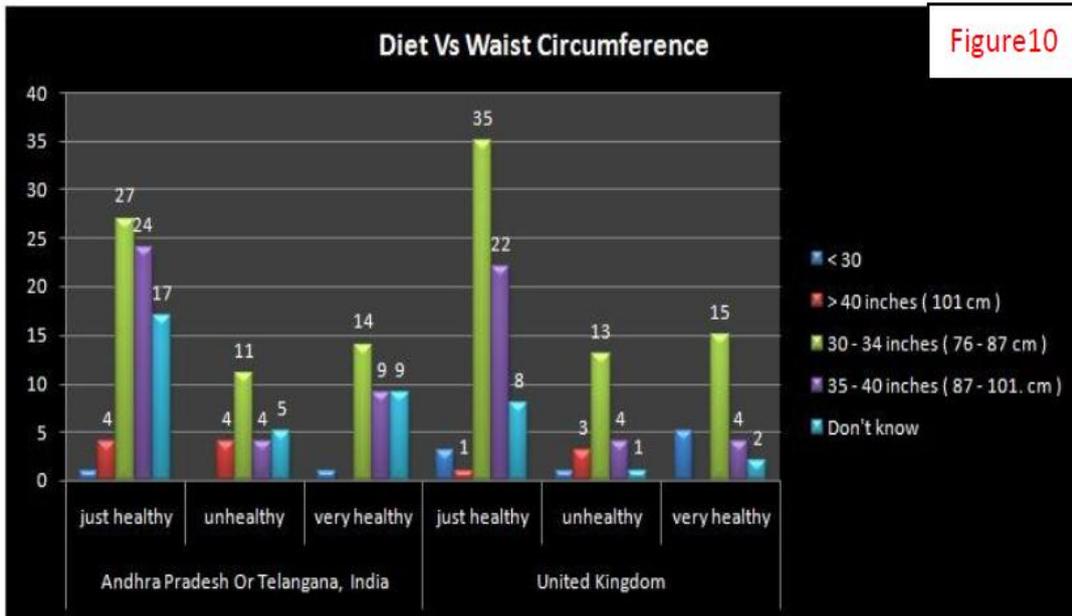


Figure10

○ **WC Vs Diet**

- Among the people who said they are having very healthy diet, there were 9 from India and 4 from UK whose WC is 35-40 inches. While majority who eat just healthy diet had WC 35-40 inches. (Figure 10).

○ **WC Vs Exercise**

- Among 12 people whose WC>40 inches, 11 reported as not been doing recommended exercise. (Figure11).

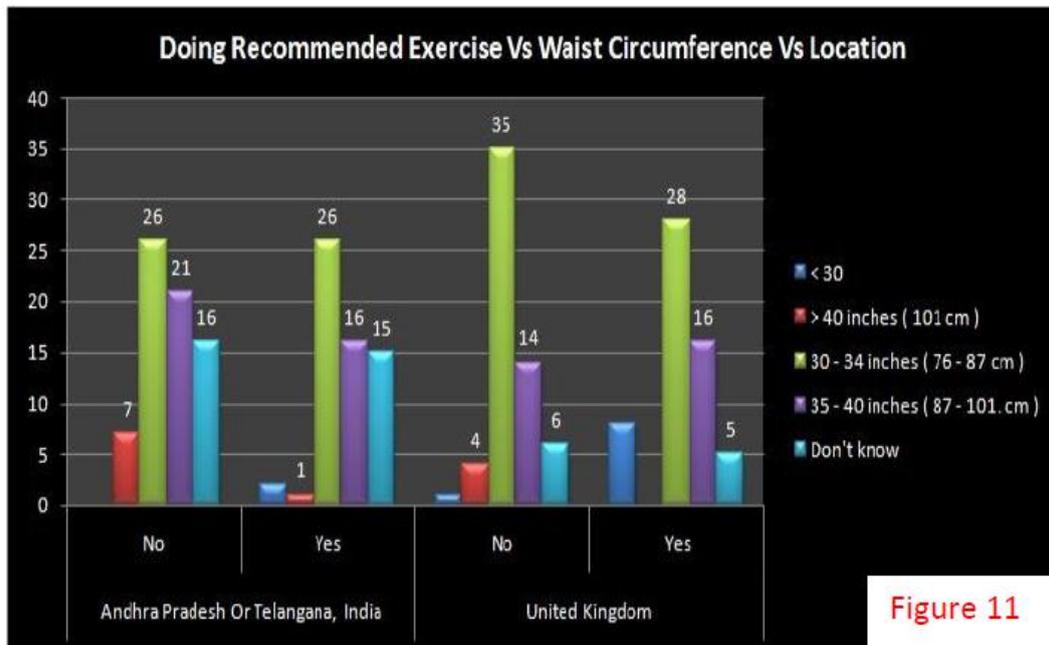
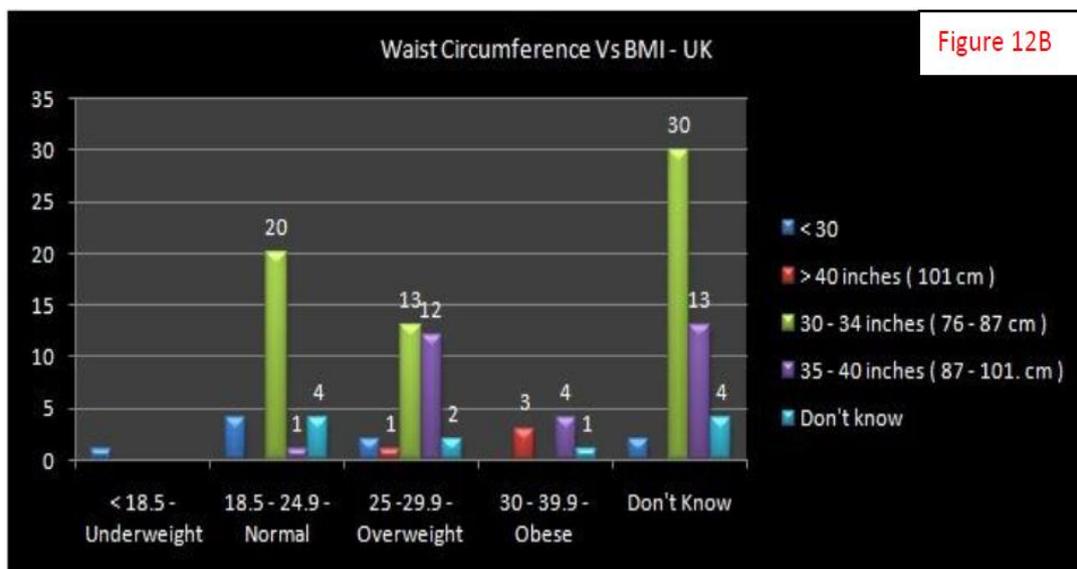
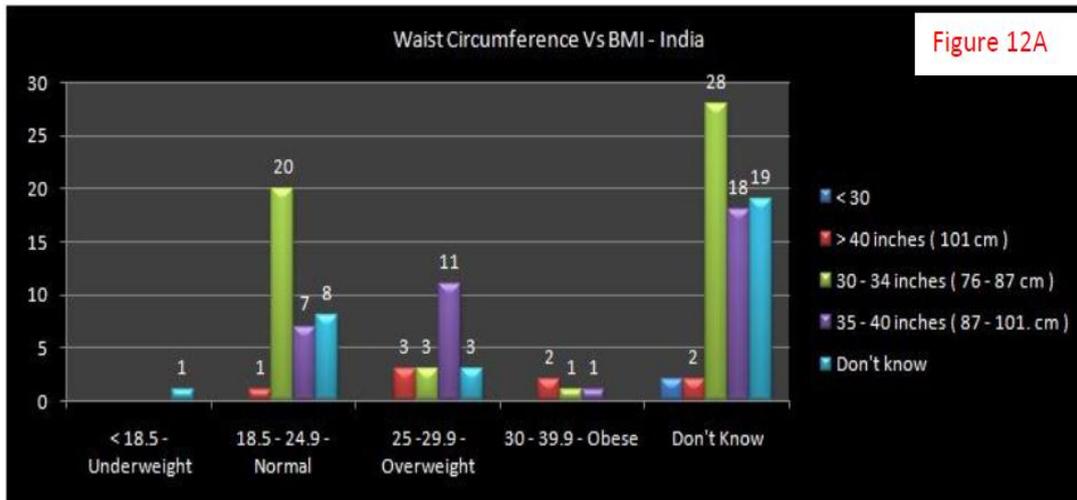


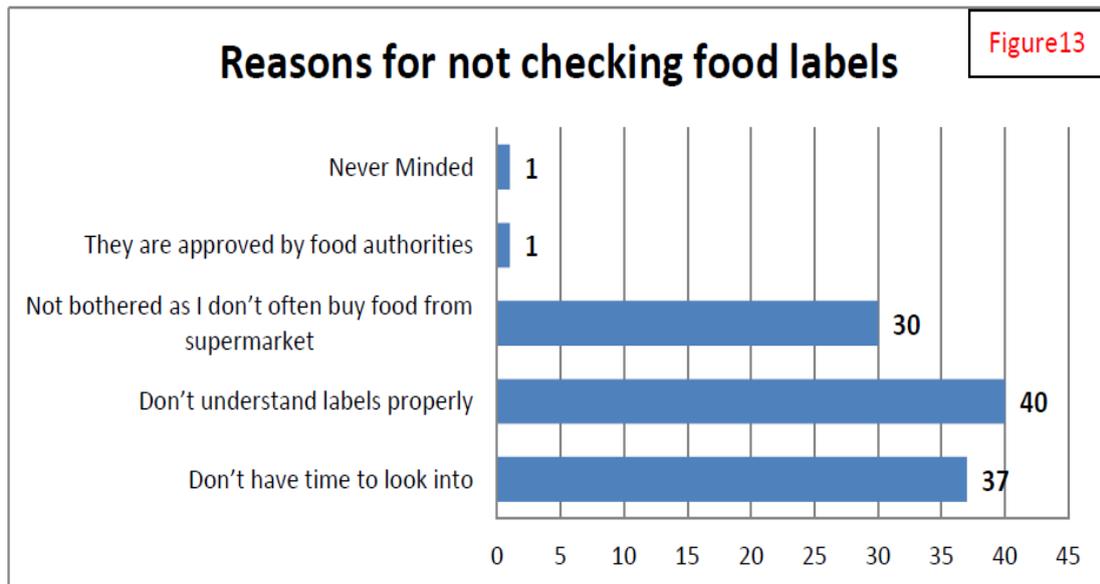
Figure 11

○ **WC Vs BMI**

- There are 7 persons in India with normal BMI but WC 35-40 inches and 1 person with WC > 40 inches and this necessitates using both BMI and WC for risk assessment (Figure12A).
- 49.6% people don't know that even if BMI is normal, they can be at risk if WC is more, UK migrants especially males are more aware compared to those in India.

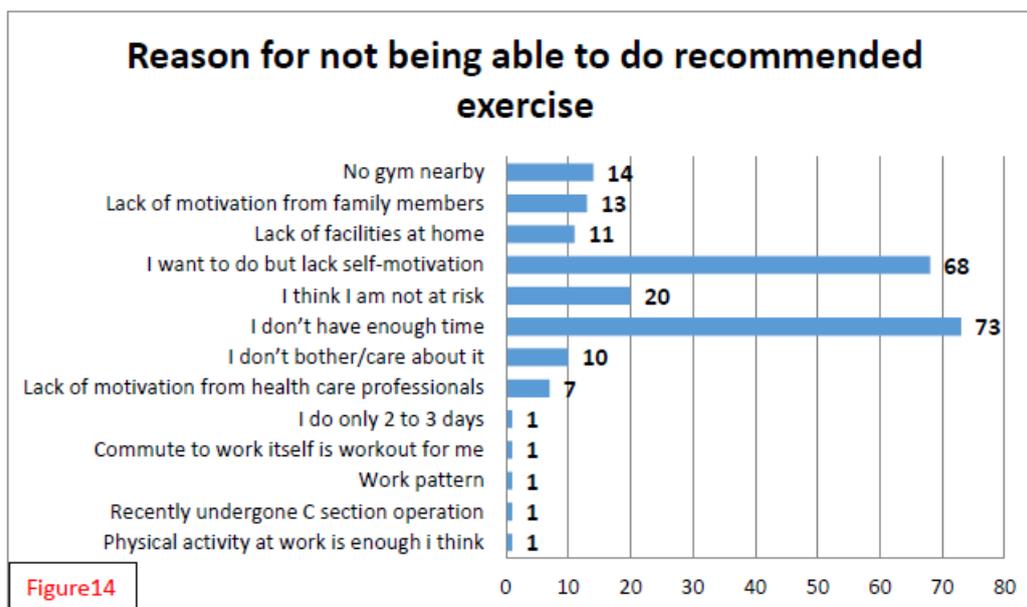


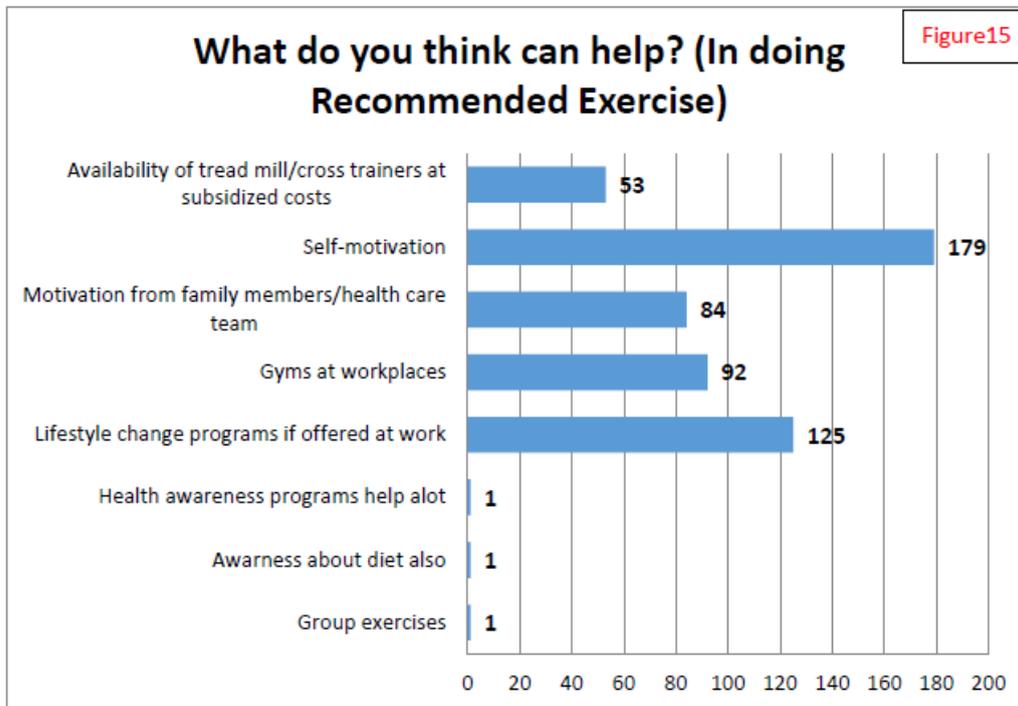
- **Health Checkups**
 - People who never had any checkup are more in India than in UK.
 - More than half of the participants might be unaware if they have any condition because they had a checkup long time ago or never had one.
- **Food Labels**
 - Only 66% participants said they check labels before buying food from supermarket and this number is slightly more in India compared to UK.
 - Reasons for not checking food labels in Figure 13.



○ **Exercise**

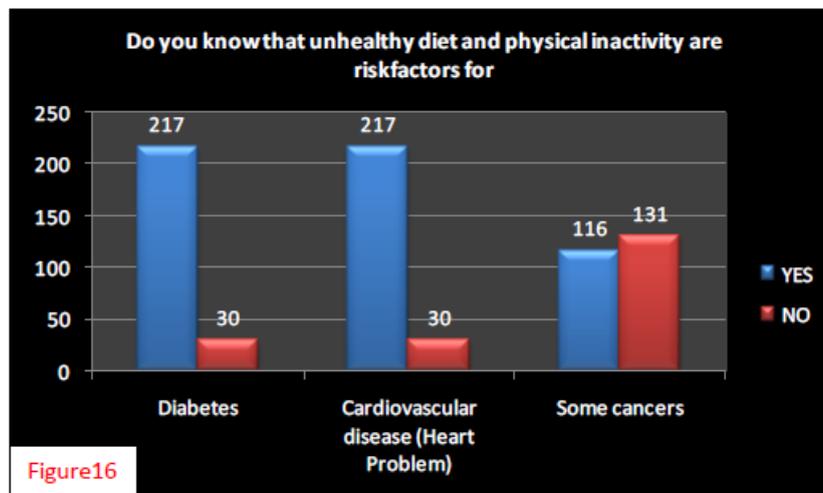
- 17% still are not aware of of exercise recommendation and half of those who know are not following it for reasons listed in Figure 14.
- Probable solutions in Figure 15.
- More females in India and males in UK reported to have been doing exercise than their counterparts.
- 20.6% don't know that though they do exercise, they can still be at risk if they are sedentary and more people in India are unaware of this.





○ **Diet**

- Awareness about unhealthy diet and physical inactivity as risk factors (Figure 16).



- 43.7% people are unaware that eating at least 400g of fruits and vegetables per day reduces the risk of some cancers.
- 54.3% don't know that foods prepared at high heat increases the risk of CVD and diabetes.
- Indian residents showed more awareness on the above mentioned facts whereas in the rest, awareness is similar or more in UK residents.
- 56.3% know that salt preserved foods and high salt content increases the risk of stomach cancers.
- 52.6% know that salt intake should be less than 5gm per day.
- 62.3% know that processed meat and red meat increase the risk of cancers.
- 30.8% are unaware that foods rich in fibre especially whole grain cereals reduce the risk of cancers.
- 34% don't know that eating Ultra-processed foods can lead to obesity, cancer and CVD.
- 65% eat these foods once or more per week and this is slightly more in Indian residents.
- Only 58.7% know that more than 65% of energy should be provided by carbohydrates mainly complex carbohydrates.
- 52.6% are yet unaware that sugars should provide only 5% of energy requirement.
- Awareness on fat recommendations in Figure 17 and 18.
- Awareness on deviation from mentioned dietary

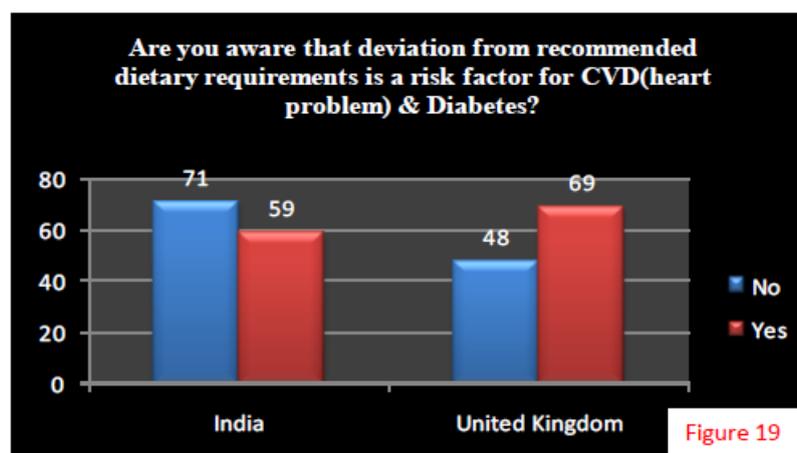
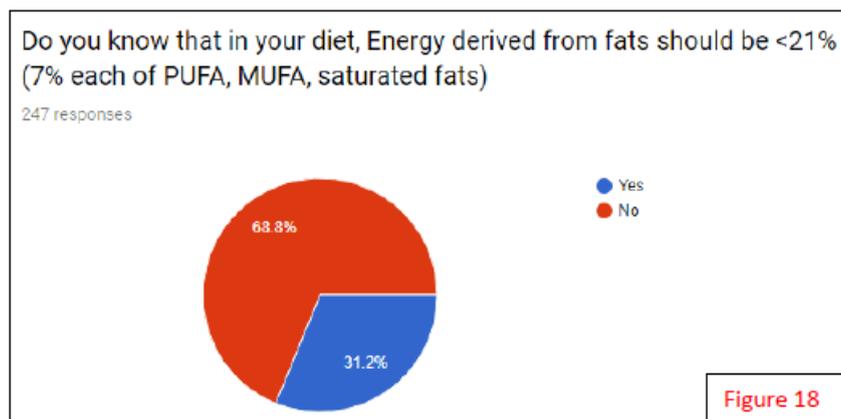
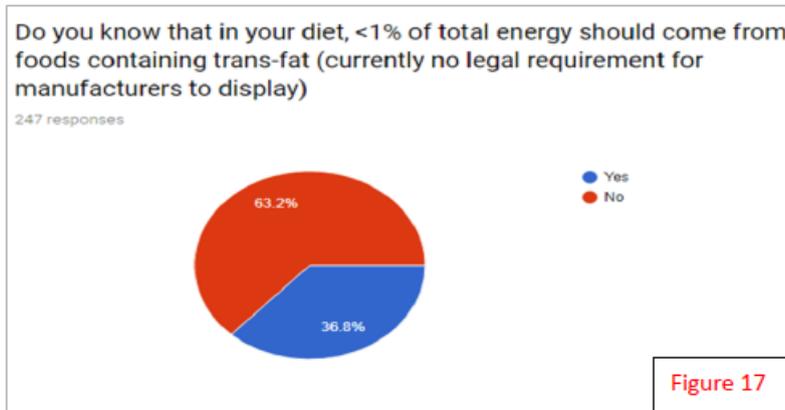
recommendation as a risk factor for CVD and Diabetes (Figure 19).

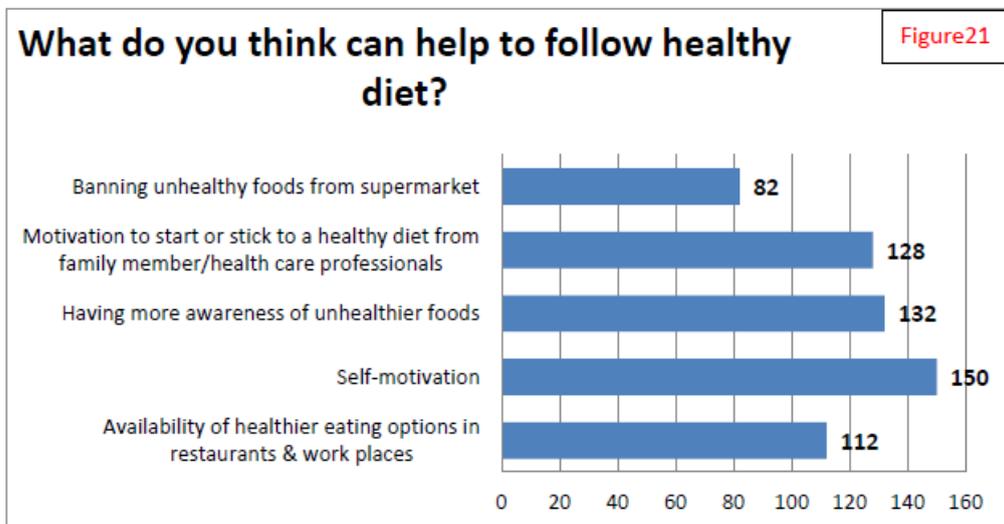
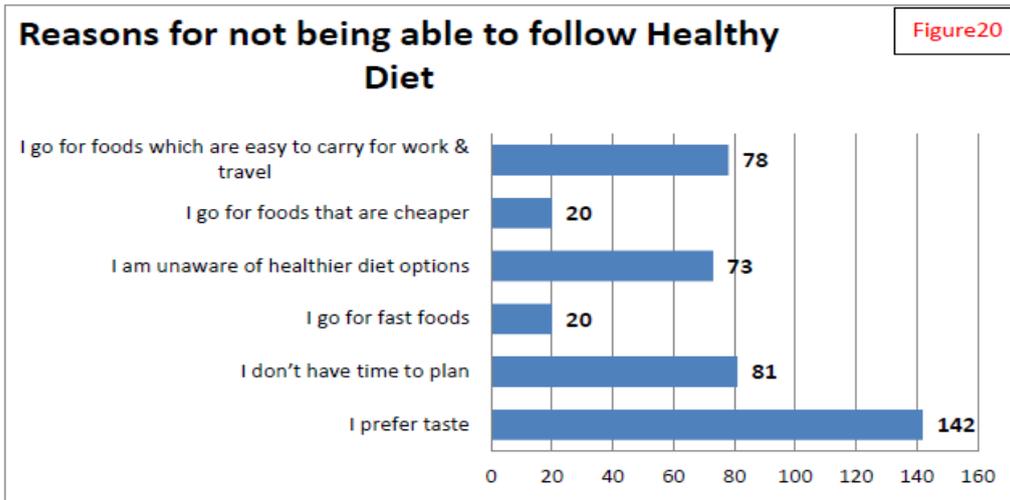
- Reasons for not being able to follow healthy diet and solutions in Figure 20 and 21 respectively.
- Diet score in Figure 22, 23 and more number of females in India and males in UK reported to have

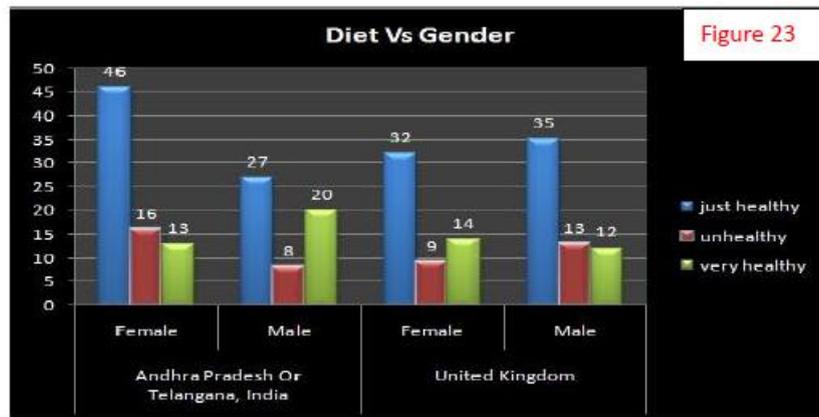
been eating unhealthy diet than their counterparts.

- Most appropriate response after going through questionnaire in Figure 24.

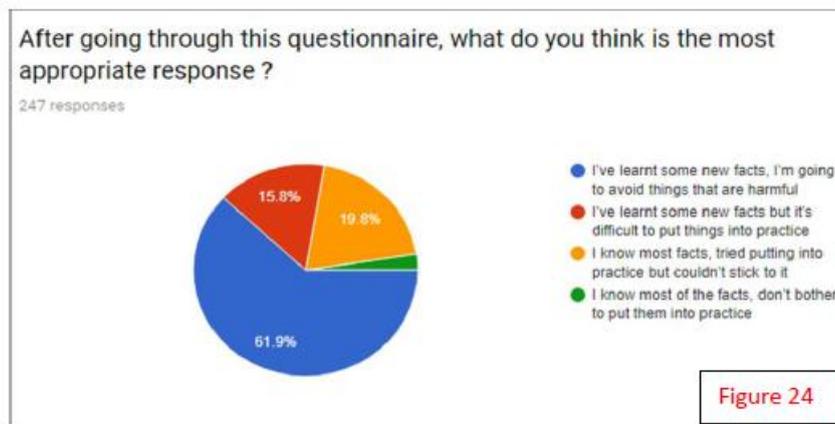
KNOW THAT TRANS-FATS SHOULD PROVIDE <1% OF ENERGY







RESPONSE AFTER QUESTIONNAIRE



Multi-sectoral approach

- Role of health care professionals –
- Identify people at risk by using ethnic specific cut offs for both BMI and WC to intervene
- Clearly explain exercise and dietary recommendation, not just saying “You have to eat healthy and do some exercise”.
- **Role of government**
- Measures to increase awareness among people by conducting health education classes, time management sessions, lifestyle change programs at schools, colleges, universities, workplaces and community level and help them to understand food labels, knowledge about unhealthy food, choose and plan diet which is not only healthy but also tasty, reiterating dietary and exercise recommendations and motivating them to start and stick to healthy lifestyle.
- Using TV, media like newspapers, internet to increase awareness might be the quickest approach.
- Ban unhealthy foods from supermarkets and impose strict laws on food manufacturers to label trans fats and colour code all foods they manufacture.
- Giving subsidies for restaurants that provide healthier diet options, seeing that gym equipment is available at subsidised costs and seeing that healthy food is not too costly(e.g. controlling the price hikes

on fruits and vegetables in India)

- Free health check-ups to screen people
- Launching and advertising evidence based nutrition advice websites and apps, e.g., Eatwell Guide(UK) and Choose MyPlate (US). In UK, it is equally important to advertise so that more people can use and reap the benefits
- Starting up new programs like change4life campaign which was recently launched in UK, to help people choose healthier food options from supermarkets. In UK this campaign is launched to tackle childhood obesity but would be much more beneficial if its gets extended to all foods available in supermarkets.
- **Role of food manufacturers**
- They should feel responsible for the health of their customers
- Avoid using cheap ingredients like partially hydrogenated vegetable oils for profits
- Manufacture healthier foods, label trans fats, colour code all foods they manufacture
- **Role of employers**
- Should take responsibility for the health of employees by implementing life style change programs, establishing gyms at work places and provide healthier diet options at canteens and work places restaurants.

- In US CDC recognised lifestyle change program reduced participants' chances of developing T2DM by 58% compared to placebo and still one-third less likely to develop T2DM a decade later than who took a placebo. It also succeeded in producing long term weight loss which is helpful to combat other obesity linked NCD's.
- Offer facilities for health check-ups.
- **Role of individual**
- After all it is important that every individual has to know the risk, get checked, follow advice, take steps to know more, implement preventive measures and motivate other family members because eating a healthy diet, increasing physical activity and avoiding tobacco can prevent 80% premature heart disease, 80% T2DM and 40% cancers.

CONCLUSION

1. Overall awareness is slightly more among people living in UK than India. But their sedentary jobs and physical inactivity might be leading to high Body Mass Index compared to their counterparts.
2. Awareness is slightly more about diet and exercise recommendation in females living in India compared to males but unhealthy diet might be responsible for higher waist circumferences in India though they reported to be physically active and doing the recommended exercise.
3. There is still lack of awareness among most educated people which necessitates measures to increase awareness. And given the positive response after going through the questionnaire, it suggests that if we motivate them, they are likely to engage in lifestyle modification.
4. There is urgent need for multi-sectoral approach to take measures and curb those preventable risk factors.

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