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ADVERTENCE ON CLIMATE CHANGE AND DIETARY CHOICES AMONG ADULTS IN COIMBATORE, TAMILNADU, INDIA

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ABSTRACT

Background: The food system is a significant contributor to global Green House Gas emissions. Greenhouse gases are produced at all stages in the system, from farming and its inputs through food distribution, utilisation, and the disposal of waste**. Objectives:** The present study is designed with the objectives of understanding the perceived knowledge, awareness, and practices of adults regarding climate change issues and their interrelations between food consumption and climate change. **Methods:** The study was carried out with 407 college students and employees aged between 20 and 60 years from Coimbatore were selected. Data was collected with the structured and validated questionnaire eliciting information about climate friendly foods. **Results:** The majority of the selected respondents say that paratha (21 percent) has high Global Warming Potential Gas followed by dosa with 10.3% and bread with 7% respectively. In cereals, majority of the selected respondents conveyed that basmathi rice and maida (24.6%) has high global warming potential gas producer, whereas butter was reported with high global gas warming producer in milk and milk

products. One-fourth of the literate respondents had knowledge about the relationship between climate change and food consumption pattern. **Conclusion:** It is an emerging need to create mass awareness programs on climate change and food security.

KEYWORDS: Climte change, food consumption, green house gas, mass awareness program.

1. INTRODUCTION

Climate change has been pervaded as the biggest global health threat of the 21st century (Costello *et al*., 2009). It has emerged as the direct global environmental problem, and the concentration of greenhouse gases in the atmosphere continues to increase. From the public health perspective it is beneficial to promote especially those climate change mitigation actions that are good for health directly. Climate-friendly food consumption is an example of such behavior: through certain dietary choices one can mitigate climate change and promote his or her own health at the same time (Aston *et al*., 2012; Scarborough *et al*., 2012).

Climate change and food production are closely connected. The production of food is a major contributor to anthropogenic greenhouse gas (GHG) emissions which are the most important cause of climate change (IPCC, 2007). Worldwide the agriculture sector is responsible for 22% of total GHG emissions (McMichael, 2007) and together with food processing it causes approximately one-third of total GHG emissions (Scialabba and Müller-Lindenlauf, 2010).

Climate change and global warming, caused by the increase in the concentration of greenhouse gases (GHGs) in the atmosphere, have emerged as the most eminent environmental issue all over the world. These GHGs viz. carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O) trap the outgoing infrared radiations from the earth's surface and thus raise the atmospheric temperature. Climate change is emerging not only as a vital environmental and public health issue (Steffen et al., 2009; Campbell-Lendrum et al., 2007) but also as a threat to food security (Schmidhuber 2007). Paradoxically, although food production is vulnerable to the effects of climate change, the food system itself is a significant contributor to global warming. Emissions of the major greenhouse gases CO2, CH4, N2O, and Hydro ChloroFluoro Carbons (HCFCs) are closely associated with food production and consumption. During the life-cycle of food, numerous human-induced activities cause emissions of these gases.

The food system is a primary contributor to global greenhouse-gas emissions. Greenhouse gases are produced at all stages within the system, from farming and its inputs through to food distribution, consumption, and additionally the disposal of waste. (Garnett., 2018) The latest Intergovernmental Panel on Climate Change report calculable that agriculture alone accounts for about 10–12% of global greenhouse gas emissions, and emanation from this sector is predicted to rise by up to half again by 2030. (Smith, Martino, et al., 2017) Agriculturally-induced change in land use such as deforestation, overgrazing, and conversion of pasture to arable land—presently accounts for a further 6–17% of global greenhouse-gas emissions (Bellarby J, Foereid B, et al., 2018).

The current food system is a vital driver of environmental pressures (Foley et al., 2005, 2011). The total environmental impact of food consumption depends on the size of the human population, the per capita consumption of food (eaten and wasted), and the impact per kg (or kcal) of food produced, transported, distributed, and ultimately disposed of. Hence the present study was taken with the objectives of understanding the perceived knowledge, awareness, and practices of youth regarding climate change issues and exploring awareness on the interrelations between food consumption and climate change among youth.

2. MATERIALS AND METHODS

2.1. Selection of samples

Selection of samples constitutes students from various colleges and employees comprising both male and female population in Coimbatore between the age group of 20-60 years were selected for the study. The technique used for collecting the population was convenience sampling. The study population covered both employed and unemployed.

2.2. Collection of data

An online questionnaire was created using Google form and the link was circulated to the selected students and employees. We received responses from 275 students and 132 employees. Knowledge and awareness of climate change and food consumption were elicited through the questionnaire.

2.3.Analysis & Interpretation of data

The collected details were consolidated, tabulated, and subjected to appropriate statistical analysis. Analyzed data was interpreted using SPSS software version 16.0.

3. RESULTS AND DISCUSSION

3.1.Dietary choices of the selected respondents

Among the selected respondents, 24 per cent of the respondents were found to be vegetarians whereas, 31 per cent of the respondents consume meat once or twice a week. About 26 per cent of the selected respondents were buying environmentally sustainable foods and 16 per cent were buying only seasonal foods.

3.2.Organic food consumption of the respondents

According to the data collected, it is noted that 37 per cent and 19 per cent of the respondents are consuming organic food at least 1 - 3 times a week and 1 – 3 times a month respectively. Seventeen per cent of the respondents eat organic food daily, whereas 7 per cent of the respondents did not prefer organic foods.

3.3.Knowledge of respondents

The results showed that 34.2 % of the selected respondents preferred sustainable diets that help to live healthy in future whereas 7.6 % of the respondents reported that diet has low environmental impacts. About 40% of the respondents think that global warming was due to all the mentioned factors such as the increase in population growth (20.6%), increase in sunspot activity and sun’s radiant energy (6%), natural fluctuation of climate periods and increase in greenhouse gas concentration. Six per cent felt that on change in the axial tilt of the earth.

Knowledge of climate-friendly foods revealed that 44% of the selected respondents think that they are consuming climate-friendly foods. Twenty three per cent of the selected respondents conveyed that carbon foot print is due to CO2 emission whereas 21 per cent of the respondents conveyed that emission of Green House Gas whereas 22.1 per cent of the respondents were unaware of carbon footprint, and 19 per cent of the respondents reported that CH4 emission and 15% of the respondents said that N2O emission. A majority of the respondents stated that the emission of greenhouse gas is CO2, CH4, and N2O (47%).

Respondents concluded that water (18.2%), livestock (29%), organic foods (23%), and processed foods (28%) emit greenhouse gas. The high global warming potential foods are dosa and bread. Majority of the population assume that paratha (21%) and burgers (20%) were the major contributors to global warming followed by chapathi (14%), dosa (10%) and idli (9%). Among cereals, Basmathi rice was said to have high global warming potential by

18% of the respondents followed by maida (25%) was a major contributor to global warming followed by 23% with none of the idea about global warming cereals. Ten per cent of the respondents reported that apple is a high global warming fruit when compared to other fruits like guava (26%), banana (21%), pomegranate (20%), and papaya (15%) ware also stated as global warming fruit.

Most of the respondents think that potatoes (24 percent) and amaranthus (19.2 per cent), brinjal (17.2 per cent) have high global warming vegetables of the respondents. Poultry, fish and mutton (34.2%, 20% and 32%) has a high global warming emission compared to other meat. Among milk and milk products 42% of the respondents claimed that cheese have high global warming when compared with curd (17%), butter (25%).

3.4.Attitude of respondents

The majority 51.4 per cent of the respondents conveyed that climate change is a very great threat to the world. About 62.2 per cent of the respondents agreed that human behaviour affected the Green House Gas and climate-changing, whereas 38 per cent of them disagreed. About 36 per cent of the respondents pointed to the correct answer that the food consumption pattern has an influence on climate change. Fifty four percentage of the respondents thought that replacing meat in healthy diets was not going to reduce 34 per cent of GHG emissions and only 16.4 per cent of the respondents stated replacing meat in healthy diets will reduce 34 per cent of GHG emissions.

3.5.Practice of respondents

Among the total respondents, 23 per cent has given importance to health while purchasing a product followed by 16 per cent of the respondents concentrated more on the quality of the product. Only 7 per cent of the respondents answered that the importance should be given to quality, organic and locally grown, sold with fair trade, and climate-friendly production. Twenty three percentage of the respondents focussed on nutritious food followed by safe foods (15.2%), whereas taste was preferred by 13% respectively.

The association of knowledge, attitude and practices with occupation of the respondents was tabulated below;

Table I: Association of knowledge, Attitude and Practices with occupation of the respondents.

Statements	Occupation
Sustainable diets	25.876(<0.05)
Global warming	51.922(<0.05)
Climate friendly foods	33.429(<0.05)
Carbon footprint	33.294(<0.05)
GHG water	28.990(<0.05)
GHG livestock	96.359(<0.05)
GHG organic food	41.171(<0.05)
HGWP foods	114.908(<0.05)
HGWP cereals	96.359(<0.05)
HGWP fruits	84.831(<0.05)
HGWP vegetables	145.004(<0.05)
HGWP meat	64.311(<0.05)
HGWP milk and milk products	42.611(<0.05)
Global warming	25.820(<0.05)
Greenhouse gas and food consumption	28.803(<0.05)
Food purchase	179.199(<0.05)
Food choice	244.793(<0.05)

**HGWP – High global warming potential, GHG – Green house gas*

It was observed that an association (<0.05) between the occupational status of the selected respondents and their attitude on sustainable diets, global warming, climate-friendly foods, carbon footprint, greenhouse gas emitted by organic food, greenhouse gas emitted by water, greenhouse gas emitted by livestock, knowledge on high global warming potential foods, high global warming potential cereals, high global warming potential fruits, high global warming potential vegetables, high global warming potential meat, high global warming potential milk, global warming, greenhouse gas and food consumption, climate changes, food purchase, food choice preference.

The association of knowledge, attitude and practices of the selected respondents were figured below;

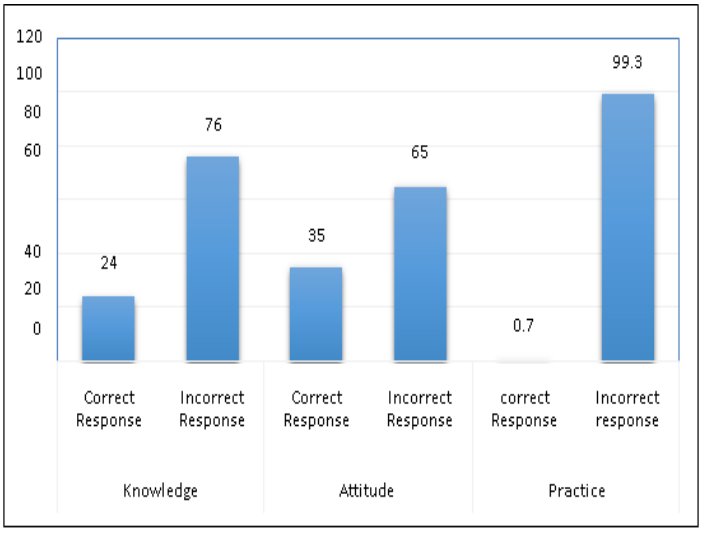

Fig. 1: Evaluation of Knowledge, Attitude and Practice of the selected respondents.

Knowledge, attitude and practices of the respondents clearly showed that only 24 per cent were having knowledge on climatic changes, 35 per cent were observed with a positive attitude toward food consumption, and only 0.7 per cent were found to practice selected activities to minimize global warming.

CONCLUSION

The study concluded with one-fourth of the literate respondents were aware of the relationships between food choices and climatic change and less than one per cent were practicing some activities to minimize the global warming. Knowledge of climatic change is essential for society including adolescents and youth, because it determines the adaptive social capacity. Providing the proper information regarding climate change and food security is a valuable investment overall as the globe is already experiencing climate change; if we are unable to take a massive action it will continue to be a massive destructor. Climate change is the greatest challenge for us, and a small knowledge can make a big impact on our mother earth.

Conflict of interest

No potential conflict of interest was reported by the authors.

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