

## ASSESSMENT OF THE PERCEPTION OF HARMFUL HEALTH EFFECTS OF MONOSODIUM GLUTAMATE AS FOOD ADDITIVE AMONG MEDICAL AND DENTAL STUDENTS OF AN INSTITUTION IN LAHORE – PAKISTAN

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### ABSTRACT

*Back Ground and Objective:* Busy life of today's world has led to consumption of processed food which contain food additives that can lead to health problems. A study was designed to assess the perception of students of medical and dental college about harmful health effects of monosodium glutamate MSG as food additive.

*Methodology:* Cross-sectional study was conducted in FMH College of Medicine and Dentistry among MBBS and BDS students. The study duration was 6 months.

*Results:* Majority of the Participants were female and their parents had education up to graduation and post-graduation, however 73.7% of mothers of BDS students were housewives and 19 and 21% of the fathers of medical and dental students respectively were health professionals. 22.8% of the students of both disciplines had the perception that MSG increases the food palatability. Quarter of MBBS and BDS student's mothers were not aware about MSG in different processed foods, however they get the information from TV and friends. Majority of the MBBS and BDS students had the perception that MSG in food causes obesity, while one third said that it can cause hypertension and this knowledge was more among the BDS students. However students of both discipline agreed to get information about MSG from internet.

*Conclusion:* Medical and dental students have inadequate knowledge about the health hazards caused by the consumption of the product containing MSG as food additive. Print, social and electronic media can play a vital role in this regard.

*Key words:* Processed food, Mono Sodium glutamate (MSG), obesity, print, social and electronic media.

### INTRODUCTION

The globalisation has affected all aspects of human life, has also influenced the eating habits of human beings.<sup>1</sup> Processed food has replaced the healthy and nutritious food.<sup>1</sup> Factors which has made processed food more consumable are time factor (easily available), taste factor (good in taste), appeal (packaging) and advertisements.<sup>2</sup> The taste factor has made the researcher think, what is the main driving force which is compelling the consumers to eat these products? One of the answer they found was the presence of "Mono Sodium Glutamate (MSG)".<sup>3</sup>

Mono Sodium Glutamate is a sodium salt of Glutamic acid, which is the most abundant naturally occurring non-essential amino acid readily available in the market and is mentioned in ingredient lists of eatables as Ajinomoto, Chinese salt, Sodium glutamate, Yeast extract or Hydrolyzed vegetable proteins etc.<sup>3</sup> In twentieth century; glutamate was extracted from the plant source i.e., sea weed. But now-a-days it is commonly

produced throughout the world by natural fermentation process.<sup>2,3</sup>

Although MSG has been used in food since it was first produced in 1909, recent concerns have developed over the safety of consuming large amounts of this compound over prolonged period of time as it can lead to many health related issues.<sup>4</sup> Food and Drug Administration (FDA) and Federation of American Societies for Experimental Biology (FASEB), has given recommendations that if the food contains less than 0.5g of MSG, it will not produce adverse effects on health.<sup>4</sup> Many researches on animals has led to the conclusion that MSG can be the cause of adverse health effects affecting every organ and system of human body ranging from obesity to brain damage.<sup>5-16</sup> It has been documented through different researches that monosodium glutamate has potential health hazards to human, for this reason, animals, especially rats, were used as subjects for experimentation. It was found that MSG showed several systemic effects when these animals were

exposed to it for a prolonged period of time in minute doses.<sup>8-12</sup>

Nowadays, due to busy and unhealthy life style, people are least concerned about what are they consuming and media is playing an important role in choosing the food.<sup>17-19</sup> Therefore, it is the need of the day that we should educate people to develop the habit of checking the food products, before buying them. People should be encouraged to check the ingredients like Mono Sodium Glutamate (MSG). Print social and electronic media can change the eating and buying habits of the consumers.<sup>22-24</sup>

**Rationale**

The purpose of this research was to assess the perception of harmful health effects of MSG as food additive among the medical and dental students. It was also an attempt to create awareness, curiosity and interest among the future health professionals, to learn about this ingredient that stimulates our taste buds on one hand, and can cause serious health issues, on the other hand.

**METHODOLGY**

It was a Cross sectional study done on M.B.B.S and B.D.S students of 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> year of Fatima Memorial Hospital College of Medicine and Dentistry, Lahore completed in six months duration. Through convenient sampling data was collected from both male and female students. Total 400 students were interviewed, half from each discipline. The rationale of the study was explained to the participants and all those willing to participate were included in the study.

The students were asked about their demographic profile and the perception of food additive with special focus on MSG and harmful health effects it can cause, in a pretested questionnaire. The completed questionnaires were entered in the computer software SPSS version 17. Means and standard deviations were calculated for quantitative variables like age. For categorical variables like student’s former education, current discipline in the college (MBBS, BDS) education of both mother and father and parent’s occupation etc., percentages were calculated. Approval for conducting the research was taken from Fatima Memorial Hospital (FMH) Institutional Review Board (IRB). An Informed consent was taken from all the participants. It was made sure by the investigator that the confidentiality of all the participants would be maintained.

**RESULTS**

The study was conducted in Fatima Memorial Hospital College of Medicine and Dentistry, in which a total of 400 students were interviewed from 1<sup>st</sup> 2<sup>nd</sup> and 3<sup>rd</sup> year, out of which 50% each were from MBBS and BDS discipline. The mean age of the students in both disciplines was 20 years and majority were females. The former education of 77% of the students was inter-

mediate. Almost 50% of the parents had education up to graduation and 15 – 30% were post-graduate, however 73.7% of mothers of BDS students were housewives and 19 – 21% of the fathers were health professionals (Table 1). About a quarter of students of both discipline were slightly aware of the food additives. More than half of the student of both disciplines were unaware about MSG and their awareness about other name of this product was also insufficient (Figure 1) however 60% of the respondents knew about the Chinese salt. 61% of the MBBS and 53% of the BDS students had the habit of checking the ingredients of the

**Table 1:** Sociodemographic profile of the participants of the study.

Variables	Description	MBBS (%)	BDS (%)
Age	Mean (Years)	20	20
Gender	Male	30.1	24.2
	Female	69.4	75.8
Year of discipline	1 <sup>st</sup> year	33.7	35.1
	2 <sup>nd</sup> year	32.6	33.5
	3 <sup>rd</sup> year	33.7	30.9
Former education	FSc	75.1	78.4
	‘A’ levels	14.5	21.1
Father education	Illiterate	0	.5
	Primary	5	0
	Matric/O-level	6.7	4.6
	Intermediate/‘A’-level	6.7	6.2
	Graduation	51.3	51.5
	Post-graduation	33.2	35.6
Maternal education	Illiterate	3.6	2.1
	Primary	1	.5
	Matric/O-level	10.4	8.8
	Intermediate/‘A’-level	13.5	13.9
	Graduation	44.6	57.2
	Post-graduation	22.3	14.9
Father occupation	Health professionals	19.2	21.1
	Others	48.7	53.1
Maternal occupation	Health professional	5.2	7.2
	Teachers	17.1	14.9
	House wives	2.6	73.7

processed food they buy and majority agreed that MSG was used as flavour enhancer. 42% of MBBS and 47% of BDS students had experienced “Chinese restaurant Syndrome”.

The knowledge of BDS students was better about the different commercially available snack which contain MSG as compared to MBBS students as shown in (Figure 2). The perception about the different beneficial health effects of MSG showed that half of the students declared that it has no beneficial effects on health (Table 2) however 23% considered that it increased the palatability. It is noteworthy that 48.7% of MBBS

and 63.4% of BDS students had the knowledge that MSG containing food causes obesity and hypertension (Figure 3, 4) respectively.

45% of MBBS and 28% of BDS students mothers were not at all aware about MSG in different processed foods (Figure 5), however 38.3% and 44.8% MBBS and BDS students mother respectively get the information regarding different food items from TV programmes and the second most important source of information was friends. 50% of MBBS students while 45% of BDS students would like to get information about MSG from internet. 49% of MBBS students while 45% of

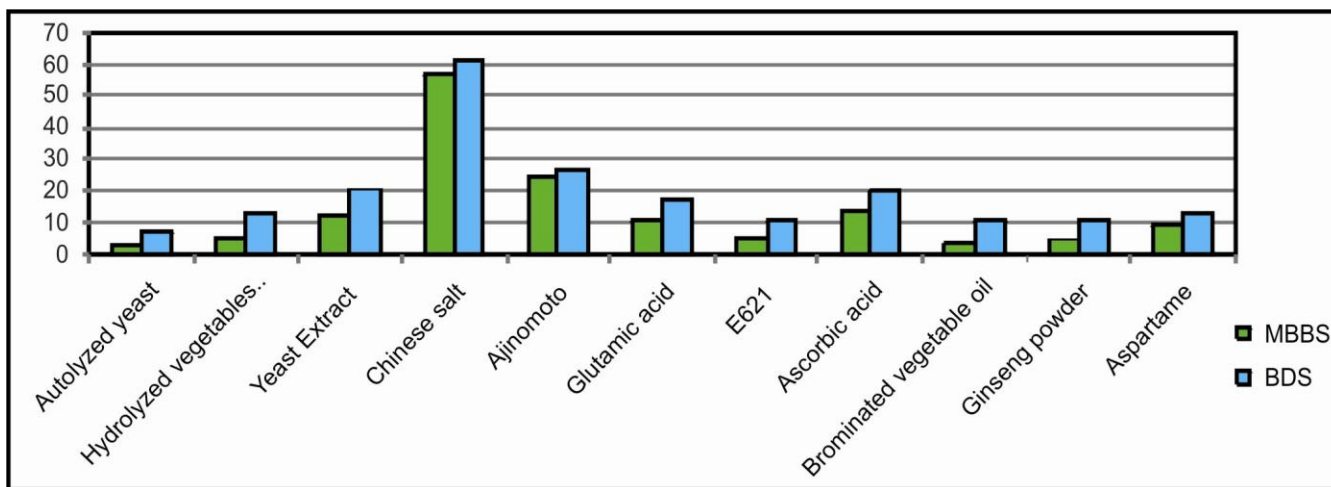


Fig. 1: Frequency distribution of awareness about the other names of MSG.

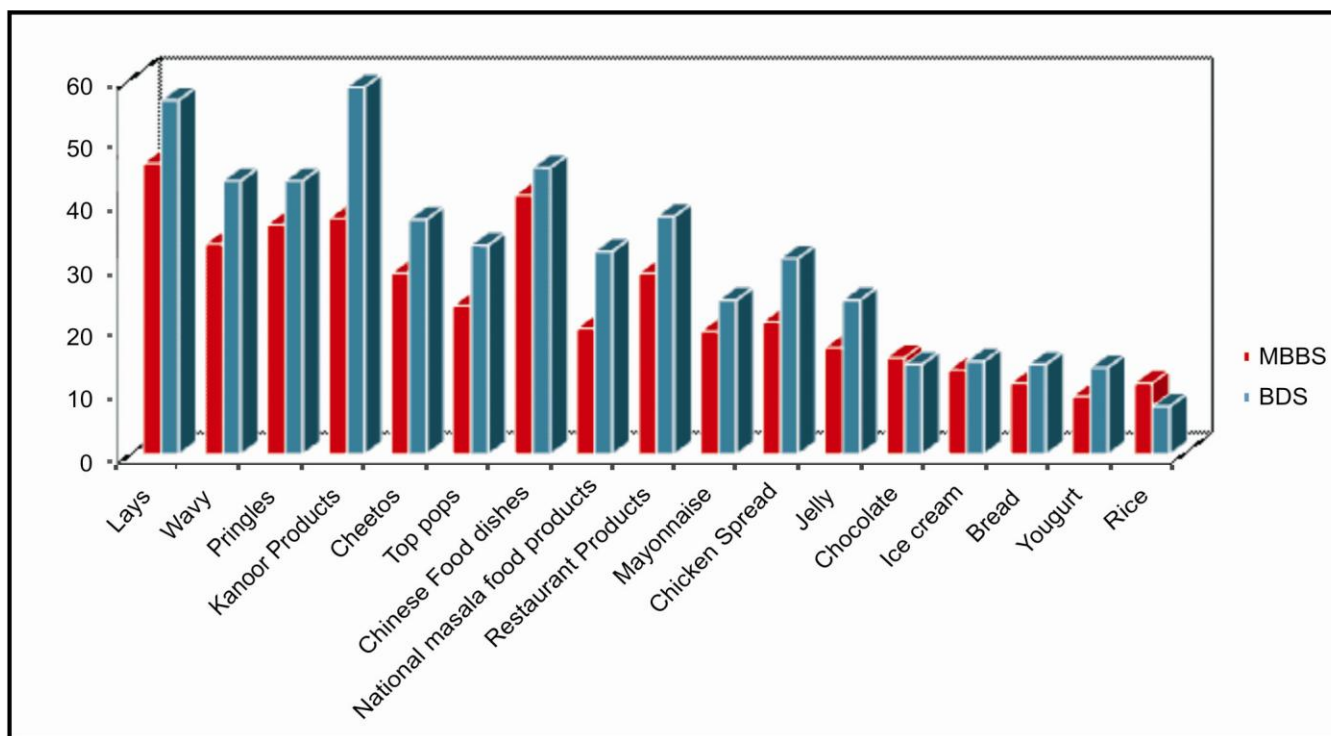


Fig. 2: Frequency of knowledge of products containing MSG.

**Table 2:** Frequency of knowledge of beneficial health effects of MSG.

	MBBS		BDS	
	(n)	(%)	(n)	(%)
None	93	48.8	99	51.0
Relieves anxiety	18	9.3	13	6.7
Improves sleep	18	9.3	12	6.2
Mood elevation	28	14.5	34	17.5
Increase palatability	44	22.8	43	22.2
Energy booster	24	12.4	27	13.9
Weight reduction	14	7.3	11	5.7
Maintains blood pressure	17	8.8	12	6.2
Prevents breathing problems	14	7.3	6	3.1

BDS students definitely considered to educate other people about the harmful effects of MSG.

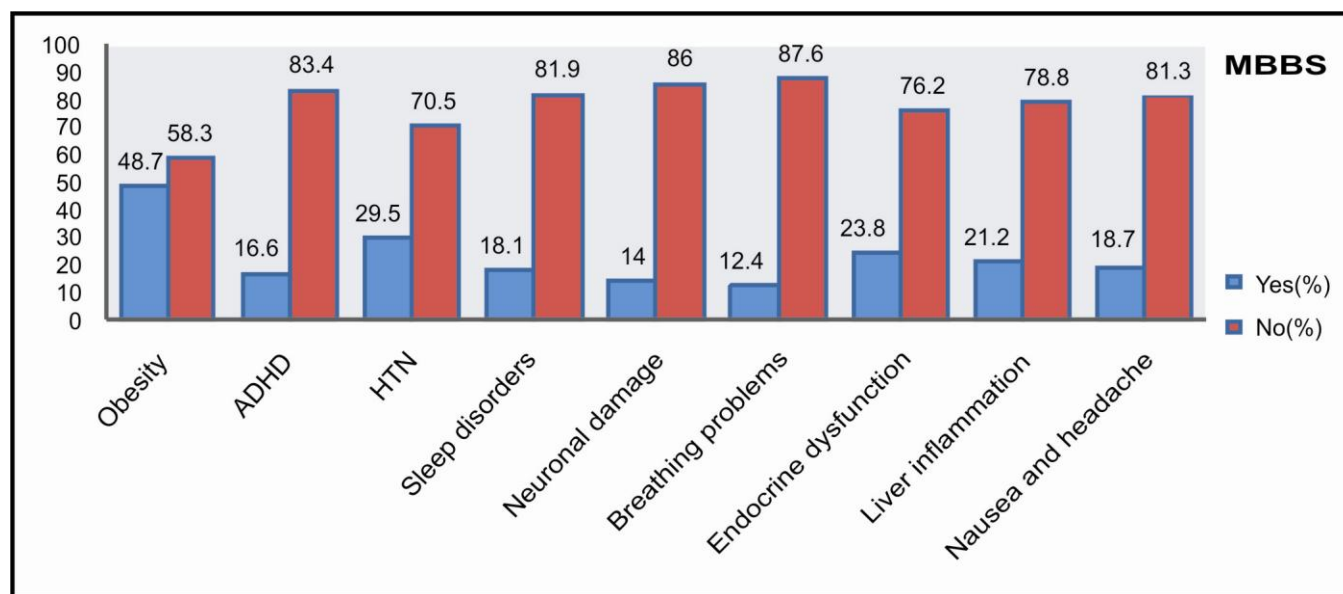
**DISCUSSION**

This study was conducted to assess the knowledge of MBBS and BDS students about harmful health effects of MSG, an important food additive used to enhance the flavour of a variety of processed food. According to our results, only one third of MBBS and BDS students were slightly aware of food additives and more than half of them were totally unaware of Mono Sodium Glutamate as food additive. Our results are supported by a study conducted on young adults of South Korea

in which two third of the respondents thought that they did not have information about food additives.<sup>16</sup> Moreover, this inadequate knowledge compel them to make wrong decision about buying processed food<sup>16</sup>. In addition Bredahl stated in his study that adults in Europe consider that food without food additive are more healthy.<sup>17</sup> Similarly in many studies it is concluded that food additive should not be used in processed food because of its innumerable health hazards.<sup>17-20</sup> So it is the need of today that people should have adequate knowledge about these food additives so that they can make healthy food choices as among the many products, associated with food safety, food additive are the most controversial one and mostly knowledge about them is wrong or insufficient.<sup>22</sup> The same has been perceived in our study that the ignorance of our students about of MSG is the reason that they are consuming it blindly. The other possible drive can be that MSG is labelled with different name on the consumable food products about which our participants had scarce knowledge.

The consumers preferences has been influenced by their level of knowledge and education status.<sup>23,24</sup> The study results has shown that half of the mothers of students were educated even then their knowledge about the harmful health effects of MSG was not up to the mark. One possible explanation might be that, most these mothers were housewives and the only source of their information was TV and friend who might not have information about the food safety of different food manufacturing products.

It is worth to emphasize that out of those who were mostly aware got this information from friends, moreover; electronic media, internet, newspaper and medical journals were also sources of information.<sup>22</sup> The



**Fig. 3:** Frequency distribution of knowledge about harmful health effects of MSG among the MBBS students.

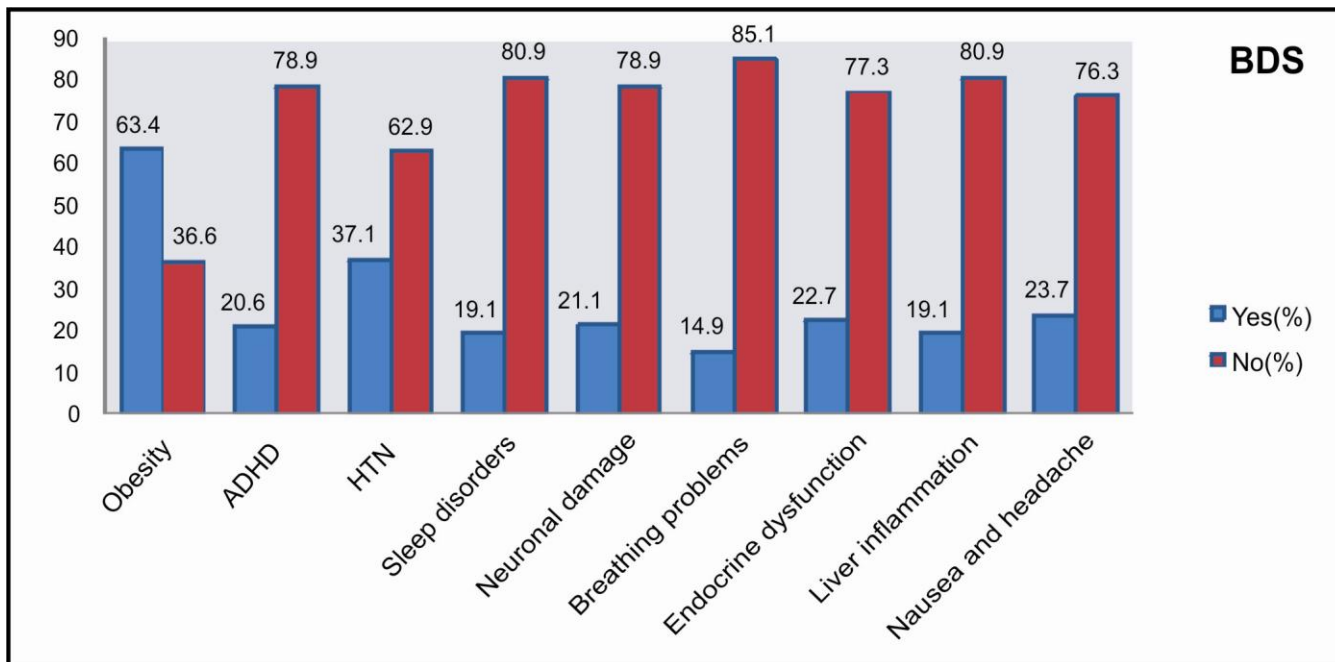


Fig. 4: Frequency distribution of knowledge about harmful health effects caused by MSG among the BDS students.

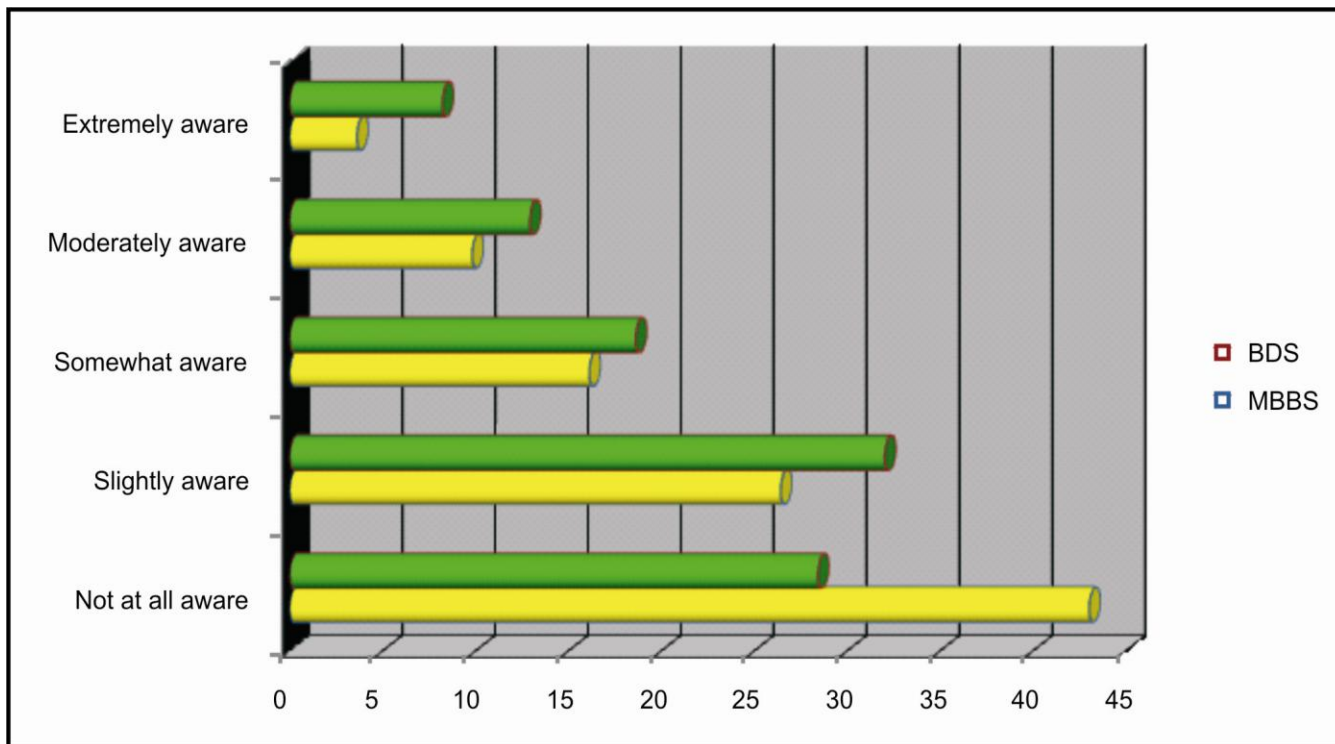


Fig. 5: Frequency distribution of awareness of mother regarding MSG.

lack of awareness of the mothers might be the reason that their children were also not aware of this harmful product. This fact is supported by a research which concluded that mother education influence the food preference but it is required that the knowledge about the ingredients should be adequate.<sup>23</sup> Another study

has also supported this fact that there is difference between the consumers and their knowledge, which is greatly influenced by the market’s promotion.<sup>24</sup> So it is a responsibility of health professionals and the stake holders to make necessary arrangements in order to increase the awareness among masses about the dif-

ferent ingredients especially the food additives used in food manufacturing.<sup>29</sup>

When students were questioned about the availability of products containing MSG, more than half of the students knew that few products contain MSG. However some were also in favor of products which actually do not contain it, which shows their lack of awareness about ingredients used in their manufacture. So research should be planned which should focus on the importance of getting the information regarding every food item being consumed.

Studies have shown that MSG has few but limited useful effects and in the current study, majority of the students responded that there are actually no useful effects on health except for the increased palatability and improving appetite.<sup>5,20</sup> Moreover, the most frequent response about the diseases MSG containing food can cause were obesity and hypertension.<sup>8-12</sup> Many researches worldwide have proved that MSG when injected in mice led to many health problems affecting every body system ranging from obesity to brain damage.<sup>8-13</sup> So it can be proposed that a randomized controlled trial should be designed in which human can be taken as subject so as to have evidenced based result of harmful health effect of MSG. Print, social and electronic media can play a vital role in changing the food inclination.<sup>28</sup>

We **concluded** that the level of awareness about the health hazards caused by the consumption of product containing Mono Sodium Glutamate (MSG) as food additive was not adequate. Print and social and electronic media can play very fruitful role in this regard.

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