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Awareness of induction cooking system in urban households of Ludhiana city

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ABSTRACT

The present study entitled "Awareness of Induction Cooking System in Urban Households of Ludhiana City**"** was undertaken to study the awareness and extent of use of induction cooking system. A sample of 120 respondents was selected randomly from urban area under municipal corporation limits of Ludhiana city. An interview schedule was prepared to collect data from the respondents. Majority (94.17 %) of the respondents were aware of induction cook-top. Majority of the respondents (83.67 %) were satisfied with ease of working of induction cook-top. Large majority of the respondents were fully aware of wide range of temperature options and possibilty of cooking under fan in induction cook-top. It was possessed by (81.67 %) of the home makers. Frequency of use of induction cook-top was daily for boiling (46.94 %), fortnightly for cooking (52.04 %), on alternate days for re-heating (59.18 %) and for *chapati* making and in emergency (64.29 %). Therefore, it is suggested that the induction cook-top need to be popularized as it is cost effective and efficient than gas cook-tops. Thus high levels of awareness and use show that induction cooking- top is a fairly new innovation that is becoming more common place in residential kitchens.

INTRODUCTION

Induction cooking system is a modern electric cook-top which works on the principal of electromagnetic induction to heat vessels. It has a number of benefits over convectional cook-tops (Renseas, 2011). An induction cooking system combines the simplicity and rapid heating quality of electric stoves with responsive temperature control (Irnich and Bernstein, 2005). Induction cooking system has qualities of flexibility, easy cleaning, good efficiency and thermal safety. Fuels play an important role in the cooking process in the kitchen. Availability of all types of cooking fuel is becoming scarce day by day, in addition to a sky high increase in their prices. These factors have prompted the homemakers as well as the home scientists to make a proper and effective utilization of fuels and to avoid all possible energy losses during cooking. Cookware must be compatible with induction heating; glass and ceramics are unusable, as are solid copper or solid aluminum cookware for most models of cooker. One of the important activities of an Indian housewife is to manage the kitchen in an effective manner with the minimum expense of money (Hydro, 2011). In the modern society, the role of a woman extends much beyond the home and upbringing of children. She has to perform two challenging roles; one of the housewife

and other of a wage earner. Both these roles make demands on her time and energy and she is left with very little time to spare for other things. In terms of time and energy consumption, the efficiency of these cooking units varies from one another. From time immemorial a constant trial has been going on to make a time and energy efficient cooking unit. A modern homemaker prefers to make use of strategies that may enable her in performing the dual duties of home-making as well as outside career (Gopalakrishnan and Parameshwari, 2014). The present study has been undertaken with the objective to study the awareness and extent of use of Induction Cooking System in urban area.

MATERIAL AND METHODS

A household survey was conducted to study the awareness and extent of use of induction cooking system. The study was conducted in Ludhiana city in year 2014. The sample for present study was drawn from urban area under municipal corporation limits of Ludhiana city. The total sample comprised of 120 households and random sampling technique was used to select the sample. Data was collected on specially structured and pre-tested interview schedule. Direct personal interview method was used for the collection of data. Out of 120 respondents, 113 were aware of induction cook-top and 98 respondents possessed induction cook-top. The purpose of the study was explained to the respondents. The responses of the respondents were transferred on the master-sheets and data were tabulated and analyzed with the help of appropriate statistical tools such as frequencies, percentages and arithmetic mean.

OBSERVATIONS AND ANALYSIS

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

General awareness regarding induction cook-top :

Data presented in Table 1 illustrate the general awareness regarding the induction cook-top. More than three fourth (77.88 %) of the respondents were fully aware of the induction cook-top, about one fourth (22.12 %) of the respondents were partially aware and very few (6.19 %) of the respondents were not at all aware of induction cook-top. More than one third (36.28 %) of the respondents were partially aware of the fuel used in induction cook-top, almost one third (33.63 %) were not aware and 30.09 per cent were fully aware of the fuel used in induction cook-top.

More than two third (62.83 %) of the respondents were fully aware about the working principle, about one fourth (24.79 %) were partially aware and 12.39 per cent of the respondents were not aware of its working principle. More than two third (67.26 %) of the respondents were fully aware of its easy portability, 20.35 per cent were partially aware and 12.39 per cent were not aware about its portability. More than half (56.64%) of the respondents were partially aware of radiation risks related to induction cook-top, about one fourth (24.78 %) of the respondents were not aware and only 18.58 per cent were fully aware of radiation risks. Few (10.62 %) of the respondents were not aware of cookware risks related to induction cook-top and very few (4.42 %) of respondents were fully aware. It is clear from the data that most of the respondents were aware of different features and health related risks of induction cook-top. It may be due to the reason that majority of the respondents were educated and were aware of availability of latest gadgets but less aware of the health related risks.

About two third (65.49 %) of the respondents were fully aware that induction cook-top was not useful for large scale cooking, more than one fourth (28.32 %) were partially aware and a few (6.19 %) were not aware. About three fourth (71.68%) of the respondents were fully aware of the fact that if induction cook-top was not cleaned then cooking was not possible, 19.47 per cent were partially aware and 8.85 per cent were not aware. About three fourth (74.34 %) of the respondents were fully aware that induction cook-top was shock resistant, 15.93 per cent were partially aware and 9.73 per cent were not aware. More than two third (69.91 %) of the respondents were fully aware that if a big vessel placed on small coil of induction cook-top, it will not heat up fully, 23.01 per cent were partially aware and 7.08 per cent were not aware. Majority (83.19 %) of the respondents were fully aware of the fact that induction cooking was possible under fan, 10.62 per cent were partially aware and a few (6.19 %) were not aware. About three fourth (74.34 %) of the respondents were fully aware about the feature that induction cook-top had overflow safety system, 13.27 per cent were partially aware and 12.39 per cent were not aware. More than

half (53.10 %) of the respondents were fully aware about the feature that induction cook-top was anti overheating, 36.28 per cent were partially aware and 10.62 per cent were not aware.

More than half (53.98 %) of the respondents were fully aware that induction cook-top had low voltage detection feature, 36.28 per cent were partially aware and 9.73 per cent were not aware. More than half (53.98 %) of the respondents were fully aware that induction cook-top had over voltage protection feature, more than one third (35.40 %) were partially aware and 10.62 per cent were not aware. About two third (65.49 %) of the respondents were fully aware about the feature that induction cook-top had wide range of power options, more than one fourth (28.32 %) were partially aware and a few (6.19 %) were not aware. Few (15.04 %) of the respondents were fully aware about the fact that single hair line crack on the heating unit could reduce the efficiency of induction cook-top, about half (49.56 %) were partially aware and more than one third (35.40 %) were not aware. Near about two third (62.83 %) of the respondents were fully aware about the fact that very small vessels could not be used on induction cook-top, 36.28 per cent were partially aware and negligible proportion (0.88 %) were not aware. About 61.95 per cent of the respondents were fully aware that placement of vessel was must on induction cook-top before switch on, more than one fourth (28.32 %) were partially aware

Table 1 : General awareness regarding induction cook-top **(n=113)**

Sr. No.	Statements	Fully aware		Partially aware		Not aware		Mean
		No.	Percentage	No.	Percentage	No.	Percentage	
1.	Awareness of the induction cook-top	88	77.88	25	22.12	7	6.19	1.78
2.	Awareness of the fuel used in induction cook-top	34	30.09	41	36.28	38	33.63	0.96
3.	Awareness of its working principle	71	62.83	28	24.78	14	12.39	1.50
4.	Awareness of its easy portability	76	67.26	23	20.35	14	12.39	1.55
5.	Awareness of health risks related to induction cook-top							
	(a) Radiation risks	21	18.58	64	56.64	28	24.78	0.94
	(b) Cookware risks	5	4.42	0	0.00	12	10.62	0.09
6.	Induction cook-top is not useful for large scale cooking	74	65.49	32	28.32	7	6.19	1.59
7.	If induction cook-top is not cleaned then cooking is not possible	81	71.68	22	19.47	10	8.85	1.63
8.	Shock resistant	84	74.34	18	15.93	11	9.73	1.65
9.	Big vessel placed on small coil will not heat up fully	79	69.91	26	23.01	8	7.08	1.63
10.	Cooking is possible under fan	94	83.19	12	10.62	7	6.19	1.77
11.	Induction cook-top has overflow safety system	84	74.34	15	13.27	14	12.39	1.62
12.	Induction cook-top is anti over heating	60	53.10	41	36.28	12	10.62	1.42
13.	Induction cook-top has low voltage detection feature	61	53.98	41	36.28	11	9.73	1.44
14.	Induction cook-top has over voltage protection feature	61	53.98	40	35.40	12	10.62	1.43
15.	Induction cook-top has wide range of power options	74	65.49	32	28.32	7	6.19	1.59
16.	Single hair line crack on the heading unit can reduce the efficiency of cook-top	17	15.04	56	49.56	40	35.40	0.80
17.	Very small vessels cannot be used	71	62.83	41	36.28	1	0.88	1.62
18.	Placement of vessel is must on cook-top before switch on	70	61.95	32	28.32	11	9.73	1.52
19.	Induction cook-top does not heat-up itself	70	61.95	38	33.63	5	4.42	1.58
20.	Expensive than other cook-tops	17	15.04	82	72.57	14	12.39	1.03
21.	High cost of repair/maintenance	14	12.39	56	49.56	43	38.05	0.74
22.	Availability of wide range of models	53	46.90	52	46.02	8	7.08	1.40
23.	Availability of hybrid cook-top	17	15.04	58	51.33	38	33.63	0.81
24.	Availability of wide range of temperature options	94	83.19	13	11.50	6	5.31	1.78
25.	More efficient than LPG cook-top	86	76.11	22	19.47	5	4.42	1.72
26.	Roasting/charring cannot be done	91	80.53	10	8.85	12	10.62	1.70

Score: Fully aware = 2 Partially aware = 1 Not aware = 0

and 9.73 per cent were not aware. Same as before about 61.95 per cent of the respondents were fully aware about the fact that induction cook-top did not heat up itself, almost one third (33.63 %) were partially aware and very few (4.42 %) were not aware.

Few (15.04 %) of the respondents were fully aware that induction cook-top was expensive than other cook-tops, about three fourth (72.57 %) were partially aware and 12.39 per cent were not aware. About 12.39 per cent of the respondents were fully aware that induction cook-top had high cost of repair/maintenance, about half (49.56 %) were partially aware and 38.05 per cent were not aware. Less than half (46.90 %) of the respondents were fully aware that induction cook-top had availability of wide range of models, 46.02 per cent were partially aware and 7.08 per cent were not aware. Majority (83.19 %) of the respondents were fully aware about the availability of wide range of temperature options in induction cook-top, 11.50 per cent were partially aware and very few (5.31 %) were not aware. More than three fourth (76.11 %) of the respondents were fully aware that induction cook-top was more efficient than liquefied petroleum gas (LPG) cook-top, 19.47 per cent were partially aware and very few (4.42 %) were not aware. Majority (80.53 %) of the respondents were fully aware about the fact that on induction cook-top roasting/charring could not be done, 8.85 per cent were partially aware and 10.62 per cent were not aware.

Awareness regarding utensils used for induction cook-top :

Table 2 illustrates the awareness regarding utensils used for induction cook-top. 48.67 per cent of the respondents were fully aware of stainless steel, 40.77 per cent were partially aware and 10.62 per cent were not aware. Similarly, more than one third (38.94 %) of the respondents were fully aware of ceramic, almost one third (33.63 %) were partially aware and more than one fourth (27.43 %) were not aware.

More than one fourth (27.43 %) of the respondents were fully aware of enamel, 41.71 per cent were partially aware and about one third (31.86 %) were not aware. Similarly, about one fourth (23.89 %) of the respondents were fully aware of cast iron, 37.17 per cent were partially aware and 38.94 per cent were not aware. The results reveal that awareness needs to be generated about the utensils/metals suitable for induction cooking.

Awareness regarding the advantages of induction cook-top :

Data presented in Table 3 illustrate the awareness of advantages of induction cook-top. Majority (81.42%)

Table 2 : Awareness regarding utensils used for induction cook-top **(n=113)**

Sr. No.	Utensils used for induction	Fully aware		Partially aware		Not aware		Mean
		No.	Percentage	No.	Percentage	No.	Percentage	
1.	Stainless steel	55	48.67	46	40.71	12	10.62	1.38
2.	Ceremic	44	38.94	38	33.63	31	27.43	1.12
3.	Enamel	31	27.43	46	40.71	36	31.86	0.96
4.	Cast iron	27	23.89	42	37.17	44	38.94	0.85

Score: Fully aware=2, Partially aware=1, Not aware=0

Table 3 : Awareness regarding the advantages of induction cook-top **(n=113)**

Sr. No.	Advantages	Agree		Undecided		Disagree		Mean
		No.	Percentage	No.	Percentage	No.	Percentage	
1.	Clean way of cooking	92	81.42	17	15.04	4	3.54	1.78
2.	Needs no protection from water	75	66.37	31	27.43	7	6.19	1.60
3.	Induction cook-top can be cleaned with any cleaning agent	42	37.17	51	45.13	20	17.70	1.19
4.	Cooking on an induction cook-top does not cause any pollution	84	74.34	27	23.89	2	1.77	1.73
5.	Food cooked is tasty	57	50.44	56	49.56	0	0.00	1.50
6.	Keeps the good nutrition content of the food	61	53.98	40	35.40	12	10.62	1.43
7.	Faster method of cooking than other cook-tops	49	43.36	45	39.82	19	16.81	1.27
8.	Wide range of power options are available	95	84.07	18	15.93	0	0.00	1.84
9.	Induction cooking is possible under fan	94	83.19	15	13.27	4	3.54	1.80
10.	Easy to operate	66	58.41	47	41.59	0	0.00	1.58

Score: Agree=2, Undecided=1, Disagree=0

of the respondents agreed that it was a clean way of cooking, 15.04 per cent of the respondents were not able to decide and very few (3.54 %) of the respondents disagreed. More than two third (66.37 %) of the respondents agreed that no protection needed from water, more than one fourth (27.43 %) of the respondents were not able to decide and a few (6.19 %) of the respondents disagreed. More than one third (37.17 %) of the respondents agreed that induction cook-top can be cleaned with any cleaning agent, 45.13 per cent were not able to decide and 17.70 per cent of the respondents disagreed. About three fourth (74.34 %) of the respondents agreed that cooking on an induction cook-top does not cause any pollution, followed by about one fourth (23.89 %) while, very small proportion (1.77 %) were undecided and disagreed. Almost half (50.44 %) of the respondents agreed that food cooked on induction cook-top was tasty, about half (49.56 %) were unable to decide and none of them were disagreed with it.

More than half (53.98 %) of the respondents agreed that it keeps the nutrition content of the food good, more than one third (35.40 %) were unable to decide and a few (10.62 %) were disagreed. Less than half (43.36 %) of the respondents agreed that it was a faster method of cooking than other cook-tops, followed by 39.82 per cent and 16.81 per cent were undecided and disagreed. Majority (84.07 %) of the respondents agreed that induction cook-top had wide range of power options, 15.93 per cent were unable to decide and none of them were disagreed. Majority (83.19 %) of the respondents agreed that induction cooking was possible under fan, followed by 13.27 per cent and very few (3.54 %) were undecided and disagreed. 58.41 per cent of the respondents agreed that induction cook-top was easy to operate, 41.59 per cent were unable to decide and none of them were disagreed.

Overall survey revealed that majority of the respondents were in the age group of 21-34 years and had educational level upto graduate. Family size of about 44.17 per cent of the respondents were 5-7 members while 66.67 per cent belonged to nuclear family system. However, majority of the respondents were employed having their income 40000-60000. Findings of the study show that all the respondents were aware of gas cook-top while high majority (94.17 %) were aware of induction cook-top and the source of information was friends, family members, relatives and neighbours. Gas cook-top was possessed by majority of the homemakers (84.17 %) followed by induction cook-top (81.67 %) and electric oven (57.50 %). About 61.39 per cent of the respondents always use gas cook-top while induction cook-top was used by 52.04 per cent. The purpose of using different cook-tops by most of the respondents was cooking followed by heating and baking. The results further show that according to respondents, the reason for purchase of different cook-tops was its safety (78.33 %). As many as 23.33 per cent of the respondents reported that gas cook-top saves time and induction cook-top saves fuel (55.83 %). The physical reason towards opinion of different cook-tops was good apperance followed by esay availability. Among the problems faced by the respondents regarding different cook-tops were more fuel consumption by gas cook-top (60.40 %), cooking gas range (76.92 %) and hob (85 %). While hybrid (56 %) and induction (59.18 %) were not suitable for large ammount of cooking as reported by the respondents. Moreover, microwave and electric oven consumed more electricity. About one third (32.65 %) of the respondents were using induction cook-top from one year. Frequency of use of induction cook-top was daily for boiling (46.94 %), fortnightly for cooking (52.04 %), on alternate days for re-heating (59.18 %) and for *chapati* making in emergency (64.29 %).

Table 4 : Frequency of usage of induction cook-top **(n=98)**

Sr. No.	Frequency of usage	Boiling		Cooking		Re-heating		*Chapati* Making	
		No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
1.	Daily	46	46.94	48	48.98	21	21.43	4	4.08
2.	Alternate days	26	26.53	26	26.53	58	59.18	4	4.08
3.	Biweekly	31	31.63	16	16.33	43	43.88	20	20.41
4.	Weekly	23	23.47	10	10.20	39	39.80	21	21.43
5.	Fortnightly	10	10.20	51	52.04	13	13.27	18	18.37
6.	Emergency	4	4.08	19	19.39	21	21.43	63	64.29
7.	When additional cook-top is required	9	9.18	54	55.10	19	19.39	11	11.22

*Multiple responses

Regarding satisfaction towards induction cook-top 83.67 per cent were staisfied with its ease of working. Large majority of the respondents were fully aware of wide range of temperature options and possibilty of cooking under fan in induction cook-top.

Though majority of respodents were aware of positive features of induction cook-top but its adoption was less as compared to LPG cook-top. It may be due to frequent power supply problems and reluctance for change over to new technique because of comfort in accustomised way of cooking.

Frequency of usage of induction cook-top :

It is evident from Table 4, under boiling, 46.94 per cent of the respondents daily used induction cook-top for boiling purpose and about one third (31.63 %) used biweekly. The reason behind this was that the respondents who were not regular users used only induction cook-top. When additional cook-top is required, more than one fourth (26.53 %) of the respondents used induction cook-top at alternate days, followed by weekly (23.47 %), fortnightly (10.20 %), (9.18 %) and very few (4.08 %) used at the time of emergency. While cooking, more than half (55.10 %) of the respondents used induction cook-top when additional cook-top was required, more than half (52.04 %) used it fortnightly. Similarly, 48.98 per cent of the respondents daily used induction cook-top, followed by alternate days (26.53 %), at the time of emergency (19.39 %), biweekly (16.33 %) and 10.20 per cent used weekly.

For re-heating, more than half (59.18 %) of the respondents used induction cook-top at alternate days, 43.88 per cent used biweekly. Similarly, 39.80 per cent of the respondents used induction cook-top weekly, followed by 21.43 per cent used daily and at the time of emergency, 19.39 per cent used when additional cook-top was required and 13.27 per cent used fortnightly. For chapatti making, about two third (64.29 %) of the respondents used induction cook-top at the time of emergency, 21.43 per cent used weekly. This may be due to the reason that induction cook-top is not suitable for charring, roasting and *chapatti* making. Similarly, 20.41 per cent of the respondents used induction cook-top biweekly, followed by fortnightly (18.37 %), when additional cook-top was required (11.22 %) and very few (4.08 %) used induction cook-top daily and at alternate days. The findings of the study were in conformity with those of Sarkar *et al.* (2006).

Conclusion :

Majority (94.17 %) of the respondents were aware of induction cook-top. Majority of the respondents (83.67 %) were satisfied with ease of working of induction cook-top. Large majority of the respondents were fully aware of wide range of temperature options and possibilty of cooking under fan in induction cook-top. Induction cook-top was possessed by (81.67 %) of the home makers. Induction cook-top was possessed by (81.67 %) of the home makers. Frequency of use of induction cook-top was daily for boiling (46.94 %), fortnightly for cooking (52.04 %), on alternate days for re-heating (59.18 %) and for *chapati* making in emergency (64.29 %).

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