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A survey to study the public awareness and knowledge of symptoms and risk factors for heart attack in Punjab

[1]Meghna Gupta, 3rd Year PG Resident, Dept of Psychiatry, Maharishi Markandeshwar Medical College and Hospital, Kumarhatti, Solan, Himachal Pradesh, India.

[2]Aman Bharti, Assistant Professor, Dept of Medicine, Guru Gobind Singh Medical College and hospital, Faridkot, Punjab, India.

[3]Poonam Bharti, Professor, Department of Psychiatry, MMIMSR, Mullana, Ambala, Haryana, India.

[4]Vitull K Gupta, Professor, Dept of Medicine, Kishori Ram Hospital and Diabetes Care Centre, Bathinda, Punjab, India.

Corresponding Author: Aman Bharti, Assistant Professor, Dept of Medicine, Guru Gobind Singh Medical College and hospital, Faridkot, Punjab, India.

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Abstract

Introduction: CVD are the leading cause of morbidity and mortality worldwide including India with ever increasing prevalence especially heart attack (HA). Evidence suggests inadequate knowledge and awareness about HA, both of symptoms and risk factor is important for reducing HA burden, morbidity and mortality.

Aims and Objectives: To study the public awareness and knowledge of symptoms and risk factors for heart attack in Punjab.

Material and Methods: A cross-sectional questionnaire-based survey was conducted with validated pretested self-administered anonymous questionnaire including socio-demographic variables comprising of six questions related to SHA including a trap question and nine questions related to RFHA including a trap question along with question regarding appropriate actions for immediate medical intervention or assistance. Survey included Punjab resident of ≥18 years of age, able to read and understand Punjabi, Hindi or English, willing to participate.

Results: 2730 subjects participated, but 264 respondents were excluded because they answered 'yes' or 'no' to all questions including trap questions and data of 2466 respondents was analysed. Most, 73.6% respondents recognized chest pain and least, 28.5% recognized difficulty in breathing as SHA whereas most, 71.8% recognized high blood pressure and least, 25.1% recognized diabetes as RFHA. 89.6% of respondents answered yes to call for immediate medical intervention. Only 12.2% had excellent awareness of SHA and 4.7% had excellent awareness of RFHA.

Conclusions: The awareness of SHA and RFHA is poor in Punjab which necessitates immediate public awareness campaigns to prevent HA and decrease its morbidity and mortality. (245)

Keywords: Heart Attack, Awareness, Symptoms of Heart Attack, Risk factors for heart attack, Punjab.

Introduction

Globally, cardiovascular diseases (CVDs) are the leading cause of death and India is no exception. In 2019, CVDs were responsible for about 17.9 million deaths and of these about 85% of deaths were because of heart attack and stroke with about three quarters of deaths were in low- and middle-income countries. In Indians, CVDs occur a decade earlier, has early age of onset, show rapid progression and high mortality rate as compared to the western population. More serious concern is that India has no structured data collection methods to access the CVD mortality and morbidity. Presently, India has been confronted with the highest burden of CAD with rural prevalence of about half than that of urban prevalence. INTERHEART study included physical inactivity and psychosocial stress as risk factors in South Asians along with conventional risk factors like diabetes (DM), hypertension (HTN), dyslipidaemia, obesity, family history of CAD and smoking to explained > 90% of AMIs in South Asians.[3]

Evidence suggest that management of heart attack (HA) or AMI has two aspect, prevention based on risk factors control and treatment based on early intervention dependent on early presentation of the patient to hospital. Pre-hospital delay has two components the 'patient delay' and 'transport delay'. The major cause of patients delay is the lack of knowledge of symptoms of heart attack (SHA). A study from UK documented significant pre-hospital delay largely because of the patient delay responsible for delayed thrombolysis that was done in only 8.4% of patients within 1 hour and 32.8% within 2 hours of symptom onset. Although CVDs are considered to have multi-factorial risk factors but most of the risk factors are controllable so CVDs can be prevented by population-based prevention programs targeting the modifiable risk factors by increasing the knowledge about SHA and risk factors of HA (RFHA) which becomes a vital prerequisite for changing health behaviours, attitudes and lifestyles of population. Several surveys have documented low levels of awareness and knowledge about SHA and RFHA leading to poor CVD outcomes.

Worldwide several studies have shown inadequate CVDs related knowledge, attitude, and practice (KAP) in populations, also highlighting the importance of improving the KAP status in reducing CVD burden. Population-based surveys and studies are very important and invaluable source of health information and provide quality data necessary for policy making and evaluation of health initiatives, but in low-income countries it is often weak, poor quality and inadequate for devising health policy. Still in India, population-based surveys have been extensively used to generate data on health initiatives like fertility, family planning and maternal and child health etc. But there is paucity of research examining public awareness of SHA and RFHA in India especially from Punjab, so present survey was conducted.

Aims and objectives

To study the public awareness of symptoms and risk factors for heart attack in the population of Punjab.

Materials and methods

A cross-sectional questionnaire-based survey was conducted in random population of Punjab from 15th, January 2020 to 1st, December 2021 with a gap during first and second wave of COVID pandemic using a validated pretested on one hundred subjects, structured self-administered anonymous questionnaire developed by the authors in three languages, English, Hindi and Punjabi including socio-demographic variables of age, gender and region. Section A of survey questionnaire comprised of six questions related to SHA including a trap question.

(1) Pain chest radiating to the neck, arms, shoulders, or the jaw, (2) Feeling weak, nausea, light headed or faint or dizziness or weak pulse, (3) Pain in center of chest, prolonged, crushing, squeezing or burning pain or discomfort, (4) Cold clammy skin, gray pallor, chills and sweating, a severe appearance of illness, (5) Difficulty in breathing or shortness of breath (6) Pain lower abdomen (trap question). Section B included nine questions related to RFHA and a trap question. (1) High blood pressure (BP), (2) Psychosocial and mental Stress, (3) Diabetes, (4) High blood lipids, (5) Family history of heart attack, (6) obesity or overweight, (7) Lack of exercise, (8) Tobacco use and smoking and (9) increased water intake. (Trap question). The last question was to assess the awareness of appropriate actions in response to SHA that will you call or seek for immediate medical intervention or assistance.

The trap questions was included to assess the possibility of respondents answering "yes" or "no" to all questions implying that such respondents were not aware of SHA and RFHA, so all those respondents were excluded from the study analysis. Respondents who answered "yes" were awarded 1 mark and those who answered "no" or "don't know" were given 0 marks. Score of 0 to 5 and 0 to 8 were calculated knowledge score respectively for SHA and RFHA. Knowledge score was categorised as low 1–2 points (~40%) and high 3–5 points (~60%) for SHA and low 1–3 points (~40%) and high 4–8 points (~60%) for RFHA on an arbitrary scale to serve the purpose of standardized comparison of awareness levels among groups.

Inclusion Criteria

Punjab resident of ≥18 years of age, able to read and understand Punjabi, Hindi or English, willing to participate.

Exclusion Criteria

Non-Punjab resident, <18 years of age, unable to read and understand Punjabi, Hindi or English, unwilling to participate.

Sampling Technique

E-copies and hard copies of anonymous completely voluntary self-administered questionnaire were distributed physically at public places and gatherings and by electronic and social media platforms to Punjab residents. Valid responses were analysed according to age, gender and region.

Study Procedure

Approval from Institutional Ethics Committee was taken before initiation of the survey.

Statistical Analysis

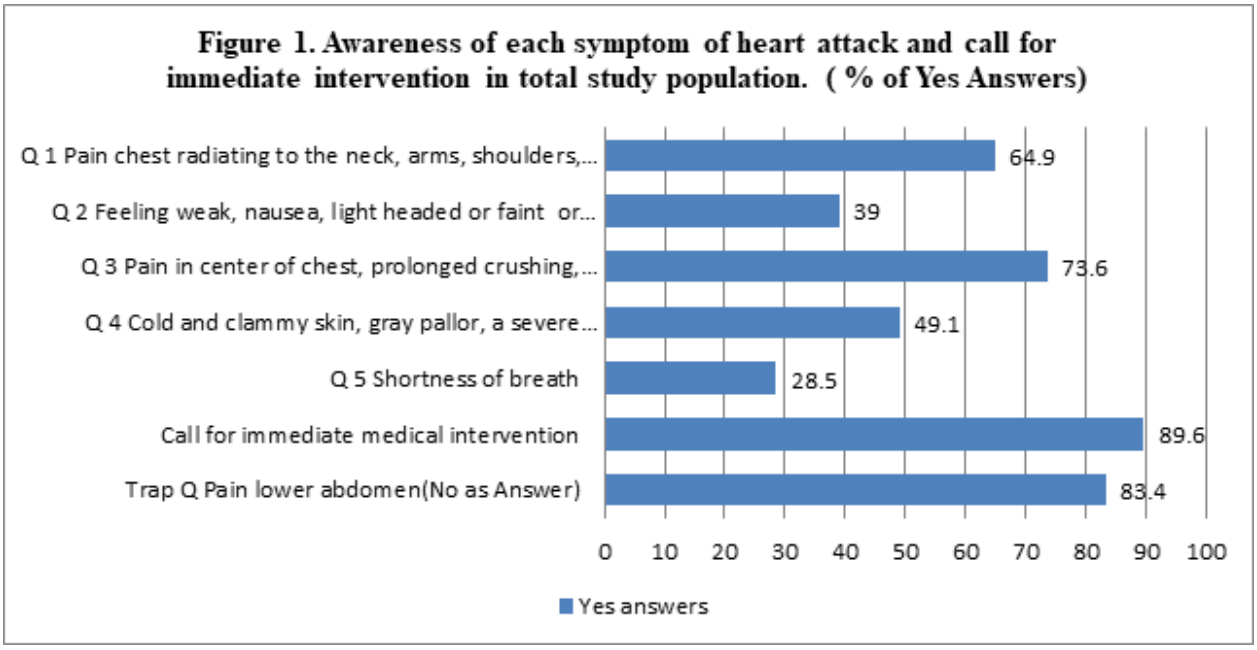
SPSS software version 23 (IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY, USA: IBM Corp.) was used to run statistical analyses. Description of respondents' sociodemographic characteristics was performed. Mann–Whitney and Kruskal–Wallis tests were used for measuring differences of ordinal variables. Chi-square tests were conducted to differentiate individuals' awareness of symptoms, risk factors and appropriate action based on socio-demographic characteristics, including gender, age and region. All tests were carried out at alpha level of 0.05. Multivariate logistic regression analysis was performed to obtain the odds ratios (ORs) and 95% confidence intervals (CIs) for the variables affecting awareness of five SHA, eight RFHA and appropriate action. The regression was used to determine the relationship between each of the factors affecting awareness and all five SHA and eight RFHA. The independent variables that were tested by the chi-square test include the socio-demographic of respondents,

Results

A total number of 2730 subjects participated in the survey, but 103 respondents answered 'yes' to all 5 SHA and trap question, 44 respondents answered 'yes' to all 8 RFHA and trap question, while 56 respondents answered 'no' to all SHA and trap questions and 61 respondents answered 'no' to all 8 RFHA and trap questions so a total of 264 respondents were excluded from to survey analysis. The survey data of 2466 subjects was analysed. The survey population included 79.4% (1958) respondents in age group of 18 to 40 years, 20.6% (508) in >40 years age group, 54.8% (1352) males, 45.2% (1114) females, 76.0% (1874) from urban region and 24.0% (592) respondents were from rural region.

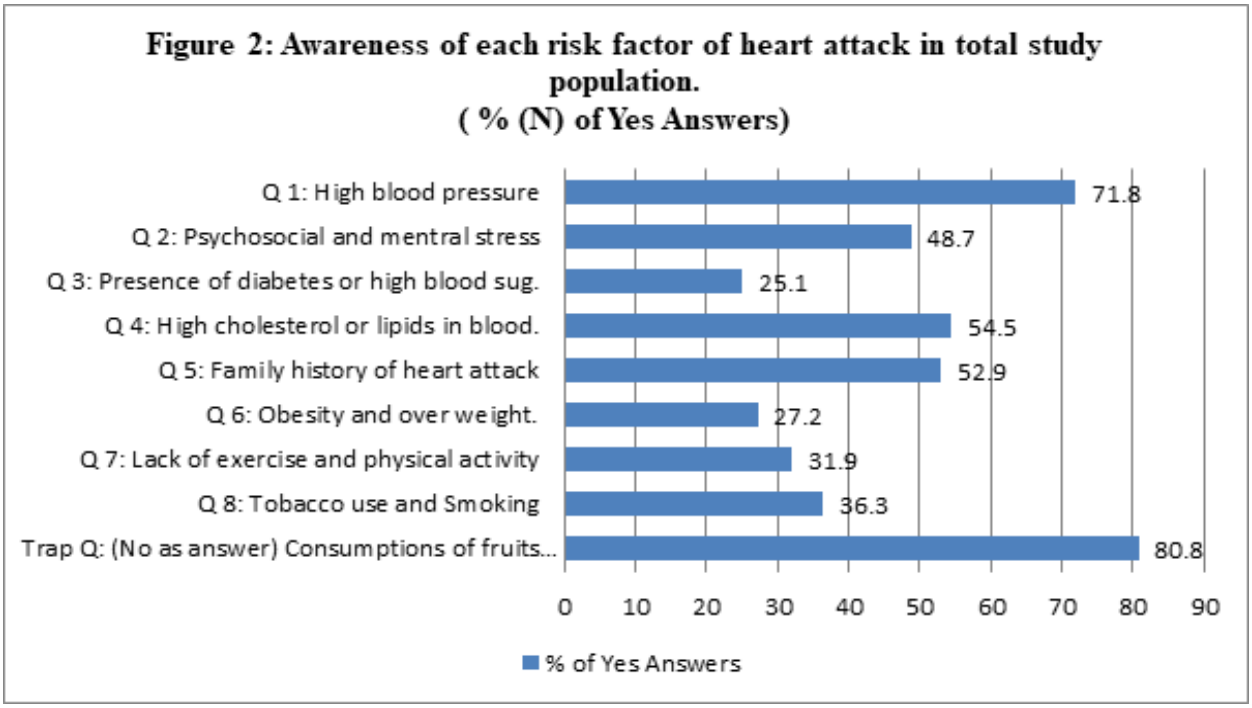
Response of study population regarding awareness of the SHA and call for immediate medical intervention is shown in figure 1. Majority of respondents 73.6% recognized question 3 and lowest 28.5% recognized question 5 as SHA. In addition, 89.6% of respondents answered yes to call for immediate medical intervention in case of experiencing SHA by self or other person.

Figure 1: Awareness of each symptom of heart attack and call for immediate intervention in total study population.



Responses of study population regarding awareness of the RFHA are shown in figure 2. Majority of respondents 71.8% recognized high BP and lowest 25.1% recognized diabetes as RFHA.

Figure 2: Awareness of each risk factor of heart attack in total study population.



Awareness of SHA and RFHA along with response to call for immediate medical intervention according to socio-demographic characteristics of age, gender and region is shown in table 1. Results show statistically highly significant difference in response to question 1 and question 4 regarding SHA among age group of 18-40 years as compared to >40 years age group, question 2 among female respondents as compared to male respondents and question 3 among male respondents as compared to female respondents. There was statistically significant difference observed in response to questions 4 and 5 of SHA among urban as compared to rural respondents and question 2 of SHA among rural as compared to urban respondents. Results show statistically highly significant difference in response to RFHA question 1 among age group of 18-40 years as compared to >40 years age group, question 2, 4 and 5 among male respondents as compared to female respondents and question 1,2,4,5 and 6 among urban respondents as compared to rural respondents, whereas statistically significant difference in response to RFHA question 2 among respondents in age group of >40 years as compared to 18-40 years age group and question 8 among female respondents as compared to male respondents. There was no statistically significant difference observed in response to question regarding call for immediate medical intervention among age and gender groups, but statistically highly significant (p-value <0.001) difference was observed in urban group as compared to rural group.

Table 1. Awareness of each symptom and risk factor of heart attack and call for immediate intervention. (% (N) of Yes Answers)

Variables (N 2466)		Total yes answer	Age Groups			Gender Groups			Region Group		
			18-40 ys (N 1958)	>40 ys (N 508)	p-Value	Males (N 1352)	Females (N 1114)	p-Value	Urban (N 1874)	Rural (N 592)	p-Value
Question related to	Q 1	64.9 (1600)	64.6 (1323)	54.5 (277)	<0.001	65.5 (885)	64.2 (715)	0.509 NS	65.2 (1221)	64.0 (379)	0.614 NS

SHA	Q 2	39.0 (962)	38.4 (752)	41.3 (210)	0.227 NS	34.0 (460)	45.1 (502)	<0.001	37.6 (704)	43.6 (258)	0.009*
	Q 3	73.6 (1814)	73.0 (1429)	75.8 (385)	0.202 NS	87.5 (1183)	56.6 (631)	<0.001	74.3 (1393)	71.1 (421)	0.078*
	Q 4	49.1 (1212)	51.3 (1005)	40.7 (207)	<0.001	42.1 (569)	57.7 (643)	0.839 NS	50.6 (948)	44.6 (264)	0.011*
	Q 5	28.5 (703)	28.8 (563)	27.6 (140)	0.595 NS	25.5 (345)	32.1 (358)	0.229 NS	29.6 (555)	25.0 (148)	0.023*
Trap Q : No to answer		83.4 (2056)	88.3 (1729)	64.4 (327)	<0.001	82.0 (1108)	85.1 (948)	<0.001	86.8 (1626)	72.6 (430)	<0.001
Call for immediate intervention		89.6 (2209)	89.8 (1759)	88.6 (450)	0.410 NS	89.6 (1211)	89.6 (998)	0.990 NS	91.5 (1715)	83.4 (494)	<0.001
Question related to RFHA	Q 1	71.8 (1771)	75.1 (1470)	59.3 (301)	<0.001	62.2 (882)	79.8 (889)	0.127 NS	77.3 (1448)	54.6 (323)	<0.001
	Q 2	48.7 (1201)	47.6 (932)	53.0 (269)	0.031*	50.4 (682)	46.6 (519)	<0.001	52.4 (982)	37.0 (219)	<0.001
	Q 3	25.1 (620)	25.2 (493)	25.0 (127)	0.934 NS	23.5 (318)	43.3 (493)	0.920 NS	24.4 (457)	27.5 (163)	0.124 NS
	Q 4	54.5 (1345)	56.2 (1101)	48.0 (244)	< 0.001	63.0 (852)	43.3 (493)	<0.001	58.4 (1095)	42.2 (250)	<0.001
	Q 5	52.9 (1305)	53.5 (1048)	50.6 (257)	0.238 NS	64.1 (867)	39.3 (438)	<0.001	58.3 (1093)	35.8 (212)	<0.001
	Q 6	27.2 (670)	27.5 (538)	26.0 (132)	0.500 NS	25.8 (349)	28.8 (321)	0.762 NS	29.1 (545)	21.1 (125)	<0.001
	Q 7	31.9 (787)	31.5 (617)	33.5 (170)	0.400 NS	27.8 (376)	36.9 (411)	0.516 NS	31.9 (598)	31.9 (189)	0.994 NS
	Q 8	36.3 (895)	35.5 (695)	39.4 (200)	0.106 NS	32.2 (435)	41.3 (460)	0.031*	37.1 (696)	33.6 (199)	0.080 NS
Trap Q: No answer		80.8 (1993)	84.8 (1660)	65.6 (333)	<0.001	83.0 (1122)	78.2 (871)	<0.001	83.4 (1562)	72.8 (431)	<0.001

SHA = symptoms of heart attack. RFHA: risk factors of heart attack. ys= years

Statistically highly significant ($p < 0.001$), * Statistically significant ($p < 0.05$), Statistically non- significant (NS)

Awareness of SHA and RFHA according to the number of symptoms or risk factors identified by the survey population and according to the socio-demographic characteristics of age, gender and region is shown in table 2.

All the respondents 100.0% recognized at least one SHA, whereas 78.0% recognised at ≥ 2 SHA, 42.7% recognised at ≥ 3, 19.0% recognised ≥4 and only 15.5% recognised all five SHA as shown in table 2. Results show statistically highly significant difference among 18-40 years age group in recognising at ≥ 3 SHA as compared to >40 years age group, among males in recognising ≥2 and ≥3 SHA as compared to females, among urban respondents in recognising at least 5 SHA as compared to rural respondents, whereas statistically significant difference was observed among 18-40 years age group in recognising ≥2 SHA as compared to >40 years age group, among urban respondents in recognising ≥ 3 and ≥4 SHA as compared to rural respondents. Only 12.2% of the respondents had excellent awareness that is recognized all five SHA, no to trap question and responded yes to calling an immediate medical intervention. Statistically significant difference was observed among 18-40 years age group as compared to >40 years and statistically highly significant (p-value <0.001) difference was observed among urban respondents as compared to rural respondents.

All the respondents 100.0% recognized at ≥1 RFHA, whereas 77.9% recognised ≥2 RFHA, 58.0% recognised ≥3 RFHA, 41.8% recognised ≥4 RFHA, 27.9% recognised ≥5 RFHA, 21.9% recognised ≥6 RFHA, 14.7% recognised ≥7 RFHA and only 6.2% recognised all eight RFHA as shown in table 2. Results show statistically significant difference among 18-40 years age group in recognising all eight RFHA as compared to >40 years age group, among males in recognising ≥6 and ≥7 RFHA as compared to females. Statistically highly significant difference was observed among males in recognising ≥2, ≥3, ≥4, ≥5 RFHA and all 8 RFHA as compared to females, among urban respondents in recognising all the RFHA as compared to rural respondents. Only 4.7% of the respondents had excellent awareness that is recognized all eight RFHA, no to trap question and responded yes to calling an immediate medical intervention and statistically highly significant difference was observed among males and urban respondents as compared to females and rural respondents.

Table 2. Awareness of HAS and HARF by the number of the symptoms and risk factors recognised by study population. % (N)

Variables			Age Groups			Gender Groups			Region Group		
Total subjects (N 2466)		Total	18-40yrs (N 1958)	>40 yrs (N 508)	p-Value	Males (N 1352)	Females (N-1114)	p-Value	Urban (N-1874)	Rural (N-592)	p-Value
Number of SHA recognised	≥ 1 SHA	100.0 (2246)	100.0 (1958)	100.0 (508)	-	100.0 (1352)	100.0 (1114)	-	100.0 (1874)	100.0 (592)	-
	≥2 SHA	78.0 (1923)	79.3 (1552)	73.0 (371)	0.003*	82.0 (1108)	73.2 (815)	<0.001	78.1 (1464)	77.5 (459)	0.763 NS
	≥3 SHA	42.7 (1054)	44.5 (872)	35.8 (182)	<0.001	46.2 (624)	38.6 (430)	<0.001	41.3 (774)	47.3 (280)	0.010*
	≥4 SHA	19.0 (469)	19.7 (385)	16.5 (84)	0.109 NS	20.1 (272)	17.7 (197)	0.125 NS	20.2 (379)	15.2 (90)	0.007*

	5 SHA	15.4 (379)	15.6 (305)	14.6 (74)	0.574 NS	15.6 (211)	15.1 (168)	0.719 NS	17.8 (333)	7.8 (46)	<0.001
5 SHA with no to trap Q		14.0 (345)	15.1 (296)	9.6 (46)	0.002*	14.7 (199)	13.1 (146)	0.250 NS	16.9 (316)	4.9 (29)	<0.001
5 SHA with yes to immediate intervention		13.4 (331)	13.5 (265)	13.0 (66)	0.746 NS	13.4 (181)	13.5 (150)	0.955 NS	16.0 (300)	5.2 (31)	<0.001
Excellent awareness: 5 SHA with no to trap Q & yes to intervention		12.2 (301)	13.1 (256)	8.9 (45)	0.010*	12.6 (171)	11.7 (130)	0.460 NS	15.3 (286)	2.5 (15)	<0.001
Number of RFHA recognised	≥ 1 RFHA	100.0 (2466)	100.0 (1958)	100.0 (508)	-	100.0 (1352)	100.0 (1114)	-	100.0 (1874)	100.0 (592)	-
	≥ 2 RFHA	77.9 (1921)	78.4 (1535)	76.0 (386)	0.243 NS	84.1 (1137)	70.4 (784)	<0.001	80.7 (1513)	68.9 (408)	<0.001
	≥ 3 RFHA	58.0 (1431)	58.9 (1153)	54.7 (278)	0.090 NS	67.2 (908)	46.9 (523)	<0.001	62.7 (1175)	43.2 (256)	<0.001
	≥ 4 RFHA	41.8 (1032)	42.4 (830)	39.8 (202)	0.285 NS	49.3 (666)	32.9 (366)	<0.001	45.6 (854)	30.1 (178)	<0.001
	≥ 5 RFHA	27.9 (688)	28.1 (551)	27.0 (137)	0.600 NS	30.9 (418)	24.2 (270)	<0.001	30.7 (575)	19.1 (113)	<0.001
	≥ 6 RFHA	21.9 (540)	22.3 (436)	20.5 (104)	0.383 NS	23.7 (320)	19.7 (220)	0.019*	24.7 (463)	13.0 (77)	<0.001
	≥ 7 RFHA	14.7 (363)	15.3 (300)	12.4 (63)	0.098 NS	16.7 (226)	12.3 (137)	0.002*	17.4 (326)	6.3 (37)	<0.001
	8 RFHA	6.2 (153)	6.7 (131)	4.3 (22)	0.049*	8.3 (112)	3.7 (41)	<0.001	7.5 (141)	2.0 (12)	<0.001
8 RFHA with no to trap Q		6.2 (153)	6.7 (131)	4.3 (22)	0.049*	8.3 (112)	3.7 (41)	<0.001	7.5 (141)	2.0 (12)	<0.001
Excellent awareness: 8 RFHA with no to trap Q & yes to intervention		4.7 (116)	5.0 (97)	3.7 (19)	0.250 NS	6.1 (83)	3.0 (33)	<0.001	6.0 (112)	0.7 (4)	<0.001

SHA = symptoms of heart attack. RFHA: risk factors of heart attack.

Statistically highly significant ($p < 0.001$), * Statistically significant ($p < 0.05$), Statistically non- significant (NS)

Table 3 show the descriptive statistics of SHA and RFHA knowledge scores of survey respondents. Results show 57.3% had low SHA knowledge score whereas 58.2% had low RFHA knowledge score. The respondents scored

an overall mean of 2.5 (SD = 1.298) out of 5 for SHA, while respondents scored an overall mean of 3.48 (SD = 2.188) out of 8 RFHA.

Table 3: Descriptive statistics of symptoms and risk factors of heart attack knowledge scores of survey respondents			
Variables		Symptoms knowledge score	Risk factors knowledge score
Score category	Low Score	57.3 (1412)	58.2 (1434)
	High Score	42.7 (1054)	41.8 (1032)
Range of knowledge scores		1--5	1-8
Mean knowledge scores		2.5	3.48
Standard deviation		1.298	2.188
Symptoms knowledge score: Low 1-2, High 3-5. Risk factors knowledge score: Low 1-3, High 4-8.			

Results of bivariate analysis of the variables stratified by high/low SHA and RFHA knowledge scores are shown in Table 4. Data analysis showed 57.3% and 58.2% had low knowledge score of SHA and RFHA respectively. Statistically highly significant difference was observed in low knowledge score of SHA among age group of >40 years as compared to 18-40 years, low knowledge score of SHA and RFHA among females as compared to males and low knowledge score of RFHA was observed among rural respondents as compared to urban respondents, whereas statistically significant difference in low knowledge score of SHA was observed among urban respondents as compared to rural respondents. Statistically not significant difference in low knowledge score of RFHA was observed among age groups.

Table 4: Bivariate analysis of knowledge of symptoms and risk factors of heart attack by independent variables. % (N)					
Variables		Knowledge score of SHA		Knowledge score of RFHA	
		1-2 (Low)	3-5 (High)	1-3 (Low)	4-8(High)
(N- 2467)		57.3 (1412)	42.7 (1054)	58.2 (1434)	41.8 (1032)
Age Groups	18-40 years	55.5 (1086)	44.5 (872)	57.6 (1128)	42.2 (830)
	>40 years	64.2 (326)	35.8 (182)	60.2 (306)	39.8 (202)
P Value		<0.001		0.285 NS	
Gender Groups	Males	53.8 (728)	46.2 (624)	50.7 (686)	49.3 (666)
	Females	61.4 (684)	38.6 (430)	67.1 (748)	32.9 (366)
P Value		<0.001		<0.001	
Region Groups	Urban	58.7 (1100)	41.3 (774)	54.4 (1020)	45.6 (854)
	Rural	52.7 (312)	47.3 (280)	69.9 (414)	30.1 (178)
P Value		0.010*		<0.001	
SHA = symptoms of heart attack. RFHA: risk factors of heart attack. Statistically highly significant ($p < 0.001$), * Statistically significant ($p < 0.05$), Statistically non- significant (NS)					

Discussion

Prevention of HA or coronary heart disease (CAD) involves primordial, primary, and secondary prevention focusing on control of CVD risk factors for which awareness and knowledge is of prime importance. On the other hand delay in recognisation of SHA leading to

delay in presentation of the patient to hospital is a global concern and studies from the United States United Kingdom and Australia showed a delay of up to 6.4 hours for presentation of patients to hospital and most important reason for this delay is the inability of patient to recognize the SHA. Amidst epidemiological transition from infectious diseases to non-communicable diseases, India's health information system has not kept up with this transition. The present cross-sectional survey was conducted in random population of Punjab to study the public awareness SHA and RFHA as well as action taken in response to SHA. Results of the present survey show suboptimal awareness of the respondents regarding the SHA and RFHA, but adequate response to calling for immediate medical intervention. In present survey, pain in center of chest was most common (73.6%) SHA recognised by respondents which is consistent with results shown by the studies from several countries Kuwait, South Korea, the US, Poland, the Emirates, Greece, and Jordan whereas a study from Nepal documented chest pain as second-most common SHA recognised by respondents. Another study reported pain chest as most common (85.1%) SHA, second common was (72.9%) shortness of breath and 66.6% radiating pain chest was the third common SHA whereas in present survey pain chest was most common 73.6% SHA, followed by 64.9% pain chest radiating to the neck, arms, shoulders, or the jaw, 49.1% cold clammy skin, gray pallor, sweating, a severe appearance of illness, 39.0% feeling weak, nausea, light headed or faint or dizziness, 28.5% the lowest percentage of the respondents recognized shortness or difficulty of breath as SHA. But a few studies from Malaysia, Poland, USA and South Korea indicated that chest pain was most recognised and pain or discomfort in the jaw, neck or back was the least-recognized SHA.25 A study from India showed that 100% of the respondents identified chest pain or discomfort as SHA, 98% loss of consciousness, 95.2% dizziness / light headedness, 93.6% palpitations, 89.6% arm pain or numbness and 77.2 % identified excessive sweating as SHA and these results were high as compared to the results of present survey. In another study 17.8% respondents identified breathlessness as SHA, 12.8% pain in the upper limbs, 12.3% fatigue, 11.5% sweating and 5.3% dizziness as SHA. A study by Khan NS et al identified excessive tiredness as SHA by 42.1% respondents, rapid heartbeat by 60.3%, pain or discomfort in the left shoulder by 44.5% as warning SHA. Western surveys also documented recognisation of chest pain as the main SHA by large study population, whereas SHA like arm and jaw pain, and shortness of breath were less commonly recognized. Another larger study observed that 87% identified chest pain as a SHA, 62% chest pain radiating to left arm or shoulder and 56% identified shortness of breath as SHA, but studies from Pakistan and Nepal documented poorer symptom knowledge than Western studies. In present study, highest numbers of respondents recognised question 3, pain in center of chest as SHA among age, male gender and region groups but highest number of respondents among female group indentified question 4 as SHA. Extreme variation in identification of SHA in various studies may be because of differences in the responses and opinions by different study populations. Among study respondents, 89.6% identified the question to call for immediate medical intervention in presence of SHA and results were almost same as observed by studies from Poland (87.4%) and the US (86%) but more as compared to a study from South Korea (67%).23 In present survey highest number of respondents 71.8% identified high BP as RFHA, followed by 54.5% high fats in blood, 52.9 family history

of HA, 48.7 stress, 36.3 tobacco use, 31.9 lack of exercise, 27.2 obesity and lowest 25.1 identified diabetes as RFHA whereas a study reported 96.4% identified hypertension as RFHA, 94.4% Family history, 89.6% overweight/ obesity, 83.4% diabetes, 81.2% excess fatty food consumption, 73.2% smoking and 70.4% sedentary life style/ Physical inactivity as RFHA.26 A study by RK Gupta et al observed 96.2% identified cigarette/beedi, 91.3% lack of physical activity. 80.24% obesity, 76.5% Junk food and 70.6% stress as RFHA and results of this study were higher as compared to the present study. As regards to number of SHA identified, the present survey demonstrated that 100% of the respondents identified >1 SHA, 78.0% identified >2 SHA, 42.7% identified >3 SHA, 19.0% identified >4 SHA, all the 5 SHA was identified by only 15.4% of respondents, 13.4% identified all 5 SHA and yes response to call for immediate medical intervention. Similar trend was observed among age, gender and region groups. A study documented that majority of respondents 81.9% identified least one SHA, only 11.5% identified all five SHA and 5.6% of the respondents recognized all five HAS and an appropriate action of calling an ambulance.23 Study form Singapore reported 85.1%, New England study reported 87%, South Korea study reported 88.7%, Poland and the US study reported 100% respondents identified one SHA. Another study from US reported 92% respondents identified at least one SHA, and 31% identified all five HAS.23 In present study only 12.2% demonstrated excellent awareness whereas another study reported only 1.3% had excellent awareness23 which was quite less as compared to results of present study. As regards to identification of number of RFHA, the present survey demonstrated that 100% of the respondents identified >1 RFHA, 77.9% identified >2 RFHA, 58.0% identified >3 RFHA, 41.8% identified >4 RFHA, 27.9% identified >5 RFHA, 21.9% identified >6 RFHA, 14.7% identified >7 RFHA, all the 8 RFHA was identified by only 6.2% of respondents and only 4.7% demonstrated excellent awareness. Similar trend was observed among age, gender and region groups. Because of paucity of studies with regards to identification of number of RFHA, the data from the present study could not be compared. In present study 57.3% respondents scored low SHA knowledge score (mean 2.5, SD 1.298), including 55.5 in 18-40 years age group, 64.2 in >40 years age group, 53.8 in males, 61.4% in females, 58.7 in urban group and 52.7 in rural group. Similarly 58.2% respondents scored low RFHA knowledge score (mean 3.48, SD 2.188), including 57.6% in 18-40 years age group, 60.2% in >40 years age group, 50.7% in males, 67.1% in females, 54.4% in urban group and 69.9% in rural group. Since there is paucity of studies, comparison of data with present study was not possible. Results of the present study shows poor awareness of SHA as well as RFHA among study population in Punjab that majority of the respondents were not aware of all five SHA and RFHA with low knowledge score for both SHA as well as RFHA and such trend was observed among age, gender and region groups, whereas the majority of the respondents were aware of chest pain as a SHA and high blood pressure as RFHA. More over majority responded to call for immediate medical intervention in case of any SHA. Such suboptimal awareness of SHA and RFHA necessitates for immediate comprehensive action plans and public awareness intervention for improving the awareness for SHA as well as RFHA to prevent HA as well as initiation of early treatment of HA to avoid increased mortality and morbidity. Public health awareness campaigns targeting non-communicable diseases or life style diseases should be initiated with the help of social and electronic as well as print media

incorporating easily understandable public campaigns, public health education efforts, supporting talks and poster exhibitions in public places to systematically improve the awareness of SHA and RFHA throughout India. Data from present survey will definitely add to the existing national data and help planning the NCD preventive strategies.

Conclusion

Results of present cross-sectional questionnaire based self-administered anonymous questionnaire comprising of questions related to SHA, RFHA and appropriate actions for immediate medical intervention conducted among Punjab resident of >18 including 2466 respondents document poor awareness that only 12.2% had excellent awareness of SHA and 4.7% had excellent awareness of RFHA but 89.6% called for immediate medical intervention. Poor level of awareness of SHA and RFHA necessitates immediate comprehensive action plans for public awareness campaigns targeting NCDs as a whole and HA in particular focusing on SHA as well as RFHA to prevent and reduce mortality related to HA. Public health awareness campaigns should be initiated involving social, electronic as well as print media including public talks and poster exhibitions with simple, pictorial and easily understandable public campaigns and public health education efforts to systematically improve the awareness of SHA and RFHA throughout India.

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